



CITY OF MANCHESTER.

REPORT

ON THE

Health of the City of Manchester,

1905,

BY

JAMES NIVEN, M.A., M.B.

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## PUBLIC HEALTH OFFICE,

TOWN HALL, MANCHESTER,

JUNE 20TH, 1906.

MY LORD MAYOR, ALDERMEN, AND MEMBERS  
OF THE CITY COUNCIL.

I have the honour to submit to you my Annual Report on the Health of the City of Manchester for the year 1905.

The death-rate for this year is considerably below any point previously reached, being, for the City, exclusive of Moss Side and Withington, 18·74 per 1,000.

Yet the position of Manchester amongst the large towns having the highest death-rate is practically unaltered.

Salford has bettered its position, largely, I believe, owing to the conversion of middens into water-closets.

The Infantile mortality in Salford, also, shows relative improvement, owing, partly, no doubt, to the conversion of the closets, partly to other causes.

Much attention is being given, at present, to the high mortality rate in infants, owing to the steady decline which is occurring in the birth-rate, while the infantile death-rate remains stationary.

Amongst other improvements indicated is the provision of trained and carefully selected lady health visitors.

A special section of the Report is devoted to a study of the mode of propagation of Enteric Fever in Manchester, the outcome of which is that direct infection and shellfish are chiefly responsible. Adequate special investigations into Enteric Fever, Diphtheria, and Diarrhœa can only be continued by an increase in the Special staff of the Medical Officer of Health.

Investigations on individual cases of Diarrhœa, and the general facts relating to this disease have again been analysed. They show that many factors contribute to the high infantile mortality, the most important being initial feebleness, deficiency in maternal care, and rapid transmission of infection in the Diarrhœa season, probably by means of flies. The storage and removal of domestic refuse are, here, also of primary importance.

The death-rate from Tubercular disease has undergone marked diminution during the last three years. It is believed that this is due, in part, to the action taken in administering the scheme of voluntary notification. The means by which further advance may be made are discussed.

The administration of the Midwives Act during 1905 is set forth in the Report of the Committee.

A Report is presented by the Medical Officer of Health for Withington on the health of that district, and it will be of great service to compare the vital statistics of a portion of the community placed under favourable conditions with those of less fortunate parts.

The Report of the Medical Superintendent of Monsall Hospital deals with the year's work in that institution. The substitution of permanent accommodation for that contained in the wooden pavilions has become necessary.

A Report is also made by the Medical Superintendent of the Baguley Sanatorium,

Summaries are given of the work of the Sanitary, Cleansing, and Food Inspection Departments.

The report of the Veterinary Surgeon on the administration of the Manchester Milk Clauses appears to show some improvement on existing conditions, but the influence of this branch of administration is greater on the quality and cleanliness of milk than on the occurrence of Tuberculosis in cattle.

During next year more attention will be given to general questions of administration, which will receive fuller treatment in the Report for 1906.

I have the honour to be,

Your obedient servant,

JAMES NIVEN,

*Medical Officer of Health.*

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# ANNUAL REPORT.

## STATISTICAL.

The following are general statistics for the year 1905:—

Area of the City in acres .....	19,059
Estimated population at the { Males ..... 303,067 } middle of 1905 ..... { Females ..... 328,866 } ....	631,933
No. of persons per acre .....	33
No. of inhabited houses at the Census taking, 1901 .....	121,688
No. of uninhabited houses at the Census taking, 1901 .....	9,525
Total No. of tenements .....	125,875
No. of tenements at the Census taking, 1901, 4 rooms and under..	62,749
Average No. of persons at the Census taking, 1901, in houses of 4 rooms and under .....	4·27
Persons married per 1000 of population in the Manchester, Chorlton, and Prestwich Unions .....	17·03
Births in the City of Manchester { Males .....9,284 } ..... { Females ....9,041 } .....	18,325
Annual birth-rate per 1000 of population .....	29·0
Deaths .. { Males ..... 5,896 } ..... { Females ..... 5,362 } .....	11,258
Annual death-rate per 1000 of { Males .... 19·45 } population ..... { Females .. 16·31 } persons ....	17·82
Deaths under 1 year of age per 1000 births.....	158·7
Excess of registered births over deaths .....	7,067
Estimated increase of population during the year .....	5,539
Annual birth-rate exclusive of Moss Side and Withington .....	30·13
„ death-rate „ „ „ .....	18·74
Infantile „ „ „ „ .....	164·42

The general figures given at the beginning of the report show that by the inclusion of Withington and Moss Side in the City the area has been increased from 12,910 to 19,059 acres. The death-rate for the year, which exclusive of the new districts would be 18.74, has by their inclusion been reduced by 0.92 per 1000. The birth-rate, which would have been 30.13, has been reduced to 29 per 1000. The infantile death-rate has been lowered from 164.4 per 1000 infants born to 158.7 per 1000. The estimated population has been increased by 69,587. The excess of registered births over deaths is 7,067, which is considerably more than the estimated rate of increase of the population. The natural rate of increase of the whole population is 11.18 per 1000 of the estimated population. This is the only figure which is not improved by the newly-added districts.

At various parts of the Statistics, distinct figures are given for the City as newly constituted, and as constituted before the inclusion of the new districts, so that a comparison may be possible with former years, while, at the same time, the extent to which individual figures are altered may be readily gathered. This is further requisite so that when one set of figures is omitted we may be able to tell what allowances are necessary in a comparison with previous years.

The following table, which is extracted from the Registrar-General's Annual Summary, permits us to compare the recorded death-rates, and the death-rates corrected for sex and age of 76 great towns.

Both from this table and the preceding figures *we observe that the uncorrected death-rate in 1905 reached an unprecedentedly low point, being for the unchanged City 18.74. This is much lower than any previous death-rate, and the average death-rate for four years has now been under 20 per 1000.*

On referring to Table 1, we find that, while the uncorrected death-rate for Manchester excluding Moss Side and Withington places six great towns below us, our corrected death-rate only leaves five towns lower on the scale.

Salford, it will be seen, occupies for 1905 a decidedly better position.

We have thus shared in a general improvement, and, although that improvement is great, it leaves us relatively little better placed than usual.



TABLE I.—RECORDED AND CORRECTED DEATH-RATES PER 1,000 PERSONS  
LIVING IN 76 GREAT TOWNS IN 1905.

TOWNS, in the order of their Corrected Death-rates	Standard Death- rate *	Factor for Correction for Sex and Age Dis- tribution †	Recorded Death- rate, 1905	Corrected Death- rate, 1905 ‡	Comparative Mortality Figure, 1905 §
Cols.	1	2	3	4	5
England and Wales .....	18·194	1·0000	15·22	15·22	1,000
England and Wales, less the 76 Towns.....	18·85	0·9652	14·80	14·28	938
76 Towns .....	17·13	1·0621	15·73	16·71	1,098
Hornsey.....	15·96	1·1400	7·57	8·63	567
King's Norton .....	17·40	1·0456	9·07	9·48	623
Leyton .....	17·69	1·0285	10·33	10·62	698
Handsworth (Staffs.).....	16·53	1·1007	10·07	11·08	728
Walthamstow.....	17·21	1·0572	10·76	11·38	748
Hastings .....	18·92	0·9616	12·77	12·28	807
Burton-on-Trent .....	16·93	1·0747	11·48	12·34	811
Willesden .....	16·96	1·0728	11·58	12·42	816
East Ham .....	17·06	1·0665	11·66	12·44	817
Croydon.....	17·75	1·0250	12·48	12·79	840
Bournemouth ... ..	17·22	1·0566	12·34	13·04	857
Northampton .. ..	17·50	1·0397	12·55	13·05	857
Brighton.....	18·46	0·9856	13·49	13·30	874
Wallasey .....	16·63	1·0940	12·54	13·72	901
Tottenham.....	16·86	1·0791	12·76	13·77	905
Reading .....	17·59	1·0343	13·40	13·86	911
Rotherham .....	17·59	1·0343	13·67	14·14	929
Leicester .....	17·05	1·0671	13·26	14·15	930
Southampton... .	18·30	0·9942	14·38	14·30	940
Ipswich .....	18·63	0·9766	14·64	14·30	940
Great Yarmouth .....	19·88	0·9152	15·78	14·44	949
Cardiff .....	16·73	1·0875	13·35	14·52	954
Smethwick.....	16·63	1·0940	13·31	14·56	957
Aston Manor.....	16·41	1·1087	13·14	14·57	957
Devonport .....	17·35	1·0486	13·92	14·60	959
Coventry .....	18·15	1·0024	14·57	14·60	959
York .....	17·67	1·0297	14·21	14·63	961
Bristol .....	17·71	1·0273	14·55	14·95	982
Walsall .. ..	17·18	1·0590	14·14	14·97	984
Wolverhampton... ..	17·59	1·0343	15·00	15·51	1,019
Norwich.....	19·05	0·9551	16·25	15·52	1,020
Derby.....	16·88	1·0778	14·56	15·69	1,031
Halifax .....	16·79	1·0836	14·62	15·84	1,041

\* The Standard Death-rate signifies the rate at all ages calculated on the hypothesis that the rates for each sex at each of twelve age-periods in each town were the same as in England and Wales during the ten years 1891-1900, the rate at all ages in England and Wales during that period having been 18·21 per 1,000.

† The Factor for Correction is obtained by dividing the Standard Death-rate in England and Wales by the Standard Death-rate in each town, and is the figure by which the Recorded Death-rate should be multiplied in order to correct for variations of sex and age distribution.

‡ The Corrected Death-rate is the Recorded Death-rate multiplied by the Factor for Correction.

§ The Comparative Mortality Figure represents the Corrected Death-rate in each town compared with the Recorded Death-rate at all ages in England and Wales in 1902, taken as 1,000.

TABLE I. (continued)—RECORDED AND CORRECTED DEATH RATES PER 1,000 PERSONS LIVING IN 76 GREAT TOWNS IN 1905—*continued.*

TOWNS, in the order of their Corrected Death-rates	Standard Death- rate*	Factor for Correction for Sex and Age Dis- tribution †	Recorded Death- rate, 1905	Corrected Death- rate, 1905‡	Comparative Mortality Figure, 1905 §
Cols.	1	2	3	4	5
London .....	17·31	1·0511	15·08	15·85	1,041
Grimsby .....	16·99	1·0709	14·82	15·87	1,043
West Ham .....	17·01	1·0696	14·84	15·87	1,043
Gateshead .....	17·26	1·0541	15·50	16·34	1,074
Plymouth .....	18·66	0·9750	16·82	16·40	1,078
Birkenhead .....	17·07	1·0658	15·40	16·41	1,078
Barrow-in-Furness .....	16·01	1·1364	14·58	16·57	1,089
Leeds .....	16·68	1·0908	15·25	16·63	1,093
Hull .....	17·75	1·0250	16·26	16·67	1,095
Bradford .....	16·46	1·1053	15·23	16·83	1,106
West Bromwich .....	18·04	1·0085	16·74	16·88	1,109
South Shields .....	17·19	1·0584	16·08	17·02	1,118
Portsmouth .....	17·72	1·0267	16·61	17·05	1,120
Newport, Mon. ....	16·84	1·0804	15·77	17·04	1,120
Bolton .....	16·09	1·1308	15·07	17·04	1,120
Nottingham .....	17·27	1·0535	16·50	17·38	1,142
Birmingham .....	16·91	1·0759	16·16	17·39	1,143
West Hartlepool .....	16·57	1·0980	15·85	17·40	1,143
Swansea .....	16·96	1·0728	16·66	17·87	1,174
Stockport .....	16·84	1·0804	16·73	18·08	1,188
Newcastle-on-Tyne .....	16·89	1·0772	16·80	18·10	1,189
Huddersfield .....	16·96	1·0728	16·97	18·21	1,196
Bury .....	16·25	1·1196	16·33	18·28	1,201
Sheffield .....	16·88	1·0778	17·00	18·32	1,204
Blackburn .....	16·09	1·1308	16·21	18·33	1,204
Warrington .....	16·89	1·0772	17·02	18·33	1,204
Rochdale .....	16·45	1·1060	16·68	18·45	1,212
St. Helens .....	16·79	1·0836	17·05	18·48	1,214
Stockton-on-Tees .....	17·35	1·0486	17·79	18·65	1,225
Burnley .....	16·14	1·1273	16·56	18·67	1,227
Salford .....	16·47	1·1047	16·94	18·71	1,229
Sunderland .....	17·64	1·0314	18·62	19·20	1,261
Preston .....	16·63	1·0940	17·91	19·59	1,287
Tynemouth .....	17·62	1·0326	19·31	19·94	1,310
Manchester .....	16·32	1·1148	17·99	20·06	1,318
Bootle .....	16·50	1·1027	18·20	20·07	1,319
Oldham .....	16·18	1·1245	17·98	20·22	1,329
Wigan .....	16·58	1·0973	18·62	20·43	1,342
Rhondda .....	16·54	1·1000	19·05	20·96	1,377
Liverpool .....	17·00	1·0702	19·63	21·01	1,380
Hanley .....	16·67	1·0914	19·31	21·07	1,384
Middlesbrough .....	16·71	1·0888	20·96	22·82	1,499
Merthyr Tydfil .....	17·16	1·0603	22·11	23·44	1,540

For Notes \* † ‡ § see page 3.

The principal causes of death during the year were :—

Phthisis ... .. 988	Premature Birth ... .. 414
Tuberculosis of Organs other than the Lungs ... .. 374	Nephritis and Bright's Disease 220
Diseases of the Heart .. 1144	Convulsions ... .. 185
Cerebral Hæmorrhage, Apo- plexy, Hemiplegia ... .. 419	Inflammation of the Brain ... 124
Pneumonia ... .. 1167	Diarrhœa and Dysentery .. 729
Bronchitis ... .. 1021	Measles ... .. 231
Atrophy, Debility (chiefly in infants) ... .. 543	Scarlet Fever .. ... 78
Old Age... .. 278	Whooping Cough ... .. 195
	Diphtheria ... .. 127
	Malignant Disease ... .. 546

It will be seen that Pneumonia and Heart Disease caused the largest number of deaths.

The death-rate from Pneumonia was higher in 1901 and 1902 ; lower in 1903, and the same in 1904. Manchester is still, however, pre-eminent in its high Pneumonia mortality, although the last three years show a reduction.

From Heart Disease the mortality was higher in 1901 and 1902, lower in 1903, and higher in 1904. On the average of the three years 1902–1904, a reduction is manifest.

These two groups are of interest in connection with the influence of alcohol on the death-rate, since it is certain that both are materially influenced by alcoholic excess.

Next in order come deaths from Bronchitis. The death-rate from this cause is decidedly lower than in any of the previous four years.

Deaths from Phthisis in 1905 yield a death-rate for the whole City of 1.56 per 1000, or excluding Moss Side and Withington of 1.68 per 1000. The lowest previous death-rate is 1.85 per 1000 in 1903. This great reduction, the



real character of which may be assumed from the reduction under Bronchitis, gives ground for lively satisfaction, and is an encouragement to further effort.

The large number of deaths from Diarrhœa must always cause us much concern. The displacement of middens, and then of pail-closets, by water-closets, along with the other alterations attendant, will do much to lower this high fatality.

The number of deaths in infants from Atrophy, Debility, etc., and from Convulsions, may be taken together as having reference to the better or worse nurture of infants.

The year 1905 shows an advance on recent years. But there is a very great amount to be done in this field.

Under the Zymotic Diseases there is a marked improvement for 1905.

These figures do, on the whole, show signs of permanent progress. The least satisfactory are those under the first two headings.

The position of the year is further illustrated by figures showing the gains and losses in the death-rates under different disease headings as compared with the average death-rates under the same headings for the previous ten years.

*Gains in 1905 per 1000 persons living, as compared with the average for the 10. years 1895-1904.—(See table K).*

Smallpox .....	0.01
Measles.....	0.38
Scarlet Fever .....	0.08
Influenza .....	0.07
Whooping Cough .....	0.14
Enteric Fever .....	0.07
Diarrhœal Diseases .....	0.21
Puerperal Fever .....	0.01
Erysipelas .....	0.01
Phthisis .....	0.36
Tuberculous Diseases (other) .....	0.21
Rheumatic Fever .....	0.01
Nervous Diseases .....	0.19
Heart and Blood Vessels Diseases .....	0.07
Bronchitis .....	0.42
Pneumonia .....	0.43
Respiratory Diseases (other) .....	0.07
Digestive System .....	0.19
Urinary System .....	0.08
Total.....	3.01



*Losses in 1905.*

Diphtheria .....	0·04
Septic Diseases .....	0·01
Alcoholism.....	0·03
Cancer .....	0·12
Premature Birth.....	0·05
Old Age .....	0·03

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Total.....	0·28
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Balance of Gain from above Causes	2·73
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Do.	All Causes	3·23
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These rates are exclusive of Moss Side and Withington.

The largest gains are under Phthisis, other Tubercular Disease, Bronchitis, and Pneumonia. The aggregate gain under Respiratory Disease, including Phthisis, amounts to no less than 1·28 per 1,000. Much of this, unfortunately, has to be regarded as temporary.

It is very noteworthy that other forms of Tubercular Disease have shared the improvement shown under Phthisis. This is an important indication that we may fairly claim the reduction in Phthisis as genuine. Considering that much of the Tuberculosis of infants is derived from relatives, it would be strange if an improvement in the death-rate from Pulmonary Tuberculosis stood alone.

The losses deserve to be scrutinised as closely as the gains. The loss of 0·12 per 1,000 under the head of Cancer is a measure of the steady advance which this terrible malady is making.

I attach but little importance to the loss under Alcoholism. That shown under Premature Birth is no doubt the result of administrative attention. Under Diphtheria, however, the loss, though small, is indicative of a tendency to increase of that disease.

The aggregate gain of the year amounts to no less than 3·23 per 1,000 persons living. This gain has reference only to the unaltered City. It represents a net gain on the year of 1,816 lives.

We have seen, in former reports, that poverty has a close relation to the death-rate in different districts of the City. Table 2, therefore, deserves to be carefully considered, especially having regard to the low death-rate in 1905. We perceive that flour and coal were cheaper than in previous years, while the price of meat was unaltered.

TABLE 2.—TOWNSHIP OF MANCHESTER.—PRICES PAID BY THE GUARDIANS FOR FLOUR, BUTCHERS' MEAT, AND COAL, ALSO THE AVERAGE WEEKLY NUMBER OF PERSONS IN RECEIPT OF RELIEF, DURING THE YEARS 1887-1905.

YEAR ENDING	PRICES OF PROVISIONS						PAUPERISM		BIRTH- RATE PER 1,000
	Flour per Sack of 280lbs.	Butchers' Meat, per lb.		Coal, per ton		Average number of Paupers relieved in each week			
		Beef		Mutton	Engine	House	Indoor	Outdoor	
		Coarse	Fine						
1887	25/2 to 30/6	-/3 $\frac{3}{4}$	-/6 $\frac{1}{2}$	-/6 $\frac{1}{2}$	5/6	8/4	3123	877	33·9
1888	24/- to 29/3	-/3 $\frac{3}{4}$	-/6 $\frac{1}{2}$	-/6 $\frac{1}{2}$	5/5	8/3	3130	713	33·3
1889	24/11 to 31/2	-/4 $\frac{1}{2}$	-/6 $\frac{1}{2}$	-/6 $\frac{1}{2}$	5/8	8/7	3037	632	33·1
1890	24/9 to 29/11	-/5	-/7	-/7	7/-	9/9	2998	498	31·8
1891	27/3 to 28/11	-/4 $\frac{1}{4}$	-/6 $\frac{1}{2}$	-/6 $\frac{1}{2}$	8/8	11/2	3118	466	33·8
1892	26/4 to 28/5	-/4	-/6 $\frac{1}{4}$	-/6 $\frac{1}{4}$	7/6	10/2	3251	551	33·4
1893	21/8 to 25/1	-/3 $\frac{7}{8}$	-/6 $\frac{1}{4}$	-/6 $\frac{1}{4}$	6/5	10/0	3277	586	33·4
1894	17/2 to 23/9	-/3 $\frac{3}{4}$	-/6	-/6	7/1	10/10	3328	395	31·8
1895	15/6 to 21/-	-/3 $\frac{3}{4}$	-/6	-/6	5/6	10/3	3343	618	33·4
1896	16/6 to 24/-	-/3 $\frac{5}{8}$	-/5 $\frac{3}{4}$	-/5 $\frac{3}{4}$	5/7	9/1	3348	533	32·8
1897	17/3 to 33/9	-/3 $\frac{1}{2}$	-/5 $\frac{5}{8}$	-/5 $\frac{5}{8}$	5/9	8/8	3476	697	32·9
1898	26/7 to 33/8	-/3 $\frac{1}{2}$	-/5 $\frac{1}{2}$	-/5 $\frac{1}{2}$	6/2	8/4 $\frac{1}{2}$	3519	732	32·3
1899	20/11 to 23/-	-/3 $\frac{1}{2}$	-/5 $\frac{5}{8}$	-/5 $\frac{5}{8}$	7/5	9/11	3232	597	32·2
1900	20/9 to 22/9	-/3 $\frac{1}{2}$	-/5 $\frac{1}{2}$	-/5 $\frac{5}{8}$	11/9 $\frac{3}{4}$	14/2 $\frac{1}{2}$	3189	686	32·4
1901	21/4 to 23/3	-/3 $\frac{5}{8}$	-/5 $\frac{5}{8}$	-/5 $\frac{5}{8}$	11/8	15/2	3403	817	28·7
1902	20/11 to 24/3	-/3 $\frac{7}{8}$	-/5 $\frac{3}{4}$	-/5 $\frac{3}{4}$	9/3	13/5 $\frac{1}{2}$	3492	752	33·0
1903	21/10 $\frac{1}{2}$ to 23/3	-/4 $\frac{3}{8}$	-/6	-/5 $\frac{1}{2}$	9/-	12/11 $\frac{1}{4}$	3521	812	31·7
1904	23/- to 28/6	-/4 $\frac{3}{8}$	-/6	-/6	8/2	11/11	3486	1459	31·1
1905	23/- to 23/9	-/4 $\frac{3}{8}$	-/6	-/6	7/6	10/9	3489	1588	29·0

TABLE 3.—POPULATIONS—DEATHS OF MANCHESTER RESIDENTS,  
1905, IN PUBLIC INSTITUTIONS.

Township	NAME OF INSTITUTION	Census Population, 1901	Deaths, 1905
ANCOATS .....	Ancoats Hospital .....	90	170
	Workhouse Casual Wards (Tame Street).....	185	...
	Workhouse Casual Wards .....	176	2
CENTRAL .....	Royal Infirmary .....	274	288
	St. Mary's Hospital .....	59	33
	Lock Hospital .....	26	...
	Eye and Ear Hospital .....	9	4
	Wood Street Mission .....	18	...
	Chetham Hospital.....	100	...
	Hardman Street Dispensary .....	...	...
ST. GEORGE'S ...	Girls' Home (Charter Street) .....	36	...
CHEETHAM ...	His Majesty's Prison .....	1,028	5
	Boys' Refuge .....	220	...
	Northern Hospital (late Clinical) .....	50	59
CRUMPSALL ...	Jewish Hospital.....	...	8
	Manchester Workhouse .....	2,767	811
BLACKLEY .....	Prestwich Workhouse .....	504	157
	Manchester and Salford Reformatory ... ..	91	...
	Litchford Hall .....	231	7
MOSTON .....	St. Mary's Home .....	45	1
	St. Joseph's Home .....	50	...
	St. Bridget's Orphanage .....	27	...
NEWTON.....	Monsall Hospital .....	428	177
	Little Sisters of the Poor (Culcheth Hall) ...	165	10
CLAYTON .....	Clayton Hospital .....	20	6
ARDWICK .....	Industrial School .....	204	...
	Nicholls Hospital .....	96	1
OPENSHAW .....	Crossley's "Home of Peace".....	10	21
RUSHOLME.....	St. Joseph's Girls' School .....	176	...
	St. Mary's Home .....	61	...
	St. Joseph's Boys' School .....	418	1
CHORLTON-ON-MEDLOCK	Royal Eye Hospital .....	103	2
	Little Sisters of the Poor (Plymouth Grove)...	199	24
	Southern Hospital .....	28	14
	Cancer Hospital .....	14	21
	Maternity Home .....	9	1
	Home for Young Girls.....	25	...
	Church Army Labour Home .....	20	...
HULME .....	Penitentiary .....	42	...
	Cavalry Barracks .....	489	1
WITHINGTON... *	Loretto Convent .....	81	...
	Chorlton Workhouse .....	2,013	711
<u>OUTSIDE CITY.</u>	Pendlebury Hospital .....	180	67
	Prestwich Lunatic Asylum .....	2,614	46
	Salford Dispensary, Hope and Bethesda Hospitals .....	...	19
	St. Joseph's Home, Eccles .....	...	1
	Infirmary, Bury.....	...	1
	Workhouse, Stockport.....	...	1
	Eccles and Patricroft Hospital .....	...	2
	Liverpool Lying-in Hospital ... ..	...	1
	Leeds General Infirmary .....	...	1
	County Asylum, Lancaster .....	...	26
	Asylum, Haydock.....	...	1
	Workhouse Hospital, Knutsford .....	...	1
	Baguley Sanatorium.....	...	2
	Blackpool Victoria Hospital .....	...	1
	Mauldeth Hospital for Incurables .....	...	4
	TOTAL DEATHS .....		2,709

\* Proportion only.



It is, therefore, matter for serious concern that the amount of outdoor relief is so much greater in 1904 and 1905 than in previous years. To some extent the increase may, probably, be set down to a change of policy. Yet one cannot view these figures without apprehension.

It is true there is one class of case in which I should like to see more assistance given, viz., where the breadwinner is stricken with disease, or where from any cause a number of young children are without sufficient means of sustenance. Such cases should receive the most careful attention, and, where reliance can be placed on the heads of the family, assistance should be rendered sufficient to keep the family well nourished until the oldest children can work. This should be done, as far as possible, by private charity, acting through the Charity Organisation Society. But, in any case, the children should be protected. I have approached the Charity Organisation Society on the matter, but they do not see that they can provide for other than temporary needs. It is from no want of appreciation of the need which exists that the Society cannot undertake to give other than temporary help. If a fund were started they would administer it with their usual efficiency. Such a fund is urgently needed. Yet I would not wish one penny spent unless the utmost care were taken to ensure that the very best use was made of it.

Attention to this most pressing need would greatly aid in the diminution of disease, which fastens on neglected and ill-nourished children.

The Medical Charities of the City, and the Union Hospitals, contribute in no small degree to the reduction of the death-rate. We have no means of determining the extent of their operations, except the number of deaths occurring in them. These are shown in table 3 (page 9).

After the Union Hospitals, the Royal Infirmary and then Ancoats Hospital have the largest number of deaths. Next to these, *longo intervallo*, we get the Pendlebury Hospital, and here we are reminded that the number of deaths is no criterion of the usefulness or of the extent of the operations of an institution, since the amount of work done by this hospital in alleviating and curing the diseases of children is very great.

The deaths occurring in public institutions are 24 per cent. of all deaths. The high proportion dying in these institutions is, therefore, maintained. It may, possibly, represent a diminished aversion on the part of the poor to seek admission into the Union Hospitals.

We may now consider more fully the vital statistics for the year, as set forth in the various statistical tables relating to the health of the City.

The usual course will be pursued of considering first general statistics relating to the whole City, then statistics of diseases relating to the whole City, then the statistics for different sanitary districts, and finally the vital statistics as modified by sex and age.

The birth-rate for the whole City, as unchanged, shows a reduction of 1 per 1,000 when compared with that of any previous year except 1901, in which year, as we have previously seen, the low birth-rate was due to arsenical poisoning. The reduction has been continuous since 1871-75, and now reaches a total amount of 8.8 per 1,000 of population.

It is true the reduction in the death-rate has been even greater. But the two facts have no necessary relation to each other, and the great drop in the birth-rate does and should cause serious misgiving.

In the Annual Summary of the Registrar General we find that, for the whole country, the rate of legitimate births, calculated on the female married population aged 15-45 years, decreased by 21 per cent.

“ There are sufficient grounds for stating that, approximately, about 21 per cent. of the decline of the birth-rate in London during the past 35 years is due to decrease in the proportion of married women in the female population of conceptive ages ; about 6 per cent. is due to the decrease of illegitimacy ; while the remaining 73 per cent. must be ascribed to the decreased fertility of married women, due in part to changes in their age constitution.”

The subject is one of practical importance, and, no doubt, the work which Dr. Newsholme is doing on the subject will lead to useful conclusions.

The percentage of illegitimate children in 1905 was lower than in other recent years.

#### *Death-rates for the whole City.*

These have already been discussed for a few causes of death. Tables K, E, and F in the Appendix furnish comparative figures of mortality from the more important causes of death for a series of years. There is no means of instituting

a comparison between Manchester and other towns in respect of special causes of death, except that the Registrar-General's Annual Summary provides comparative figures for the principal zymotic diseases.

From all forms of infectious disease 1905 gave favourable results, as compared with the average of ten previous years, excepting only from Diphtheria. The other diseases—Measles, Scarlet Fever, Influenza, Whooping Cough, Enteric Fever, Diarrhœa, Puerperal Fever, and Erysipelas—all yielded death-rates below the average. The figures for Enteric Fever and Scarlet Fever are especially satisfactory. Nor does Manchester stand badly in a comparison with other towns from these causes of death.

We have already seen that 1905 shows a great improvement under Phthisis and Respiratory Disease. This is also the case under Nervous Diseases, Diseases of the Digestive System, and Urinary Diseases, so that in almost every direction the year marks improvement. Under Cancer alone is there marked loss of ground.

*Vital Statistics for different Sanitary Districts of the City.*

The Manchester Township is divided into three Sanitary Districts, the Northern Division into nine, and the Southern Division into eight. The statistics relating to the three main divisions will usually be found in the same tables with those relating to the sub-districts, but it appears convenient to say a few words first about the principal divisions of the City.

Referring first to tables G and H, we see that the death-rate by no means diminishes in correspondence with the birth-rate. The birth-rate of North Manchester exceeds that of South Manchester, but the death-rate is higher in the Southern Division. The order of the death-rate is the same order as that of the proportion of persons dying in the workhouse. A table has been given annually, showing the death-rate of persons in the different districts who die at home, after removal to the Union Hospital, and after removal to other institutions respectively. The proportion of persons dying in institutions from each district can be seen at a glance, and can be calculated from the figures given in this table.



TABLE 4.—1905.—DEATH-RATES\* IN THE HOMES OF THE PEOPLE, IN WORK-  
HOUSES, AND IN HOSPITALS FOR THE VARIOUS DIVISIONS OF THE CITY.

STATISTICAL DIVISIONS	Estimated Populations to middle of 1905	Death-rate per 1000 of persons dying in their own homes	Death-rate per 1000 of persons dying in Workhouses	Death-rate per 1000 of persons dying in Hospitals	Total death-rate per 1000	Mean death-rate 1881-1900
City of Manchester. ...	631,933	1·353	2·66	1·62	17·82	23·28 <sup>†</sup>
I. Manchester Township..	129,452	15·49	6·22	2·68	24·39	30·04
II. North Manchester .....	182,193	12·71	0·87	1·31	14·89	18·31
III. South Manchester .....	320,288	13·20	2·24	1·38	16·82	22·24
I. { Ancoats .....	43,881	16·25	5·22	3·44	24·91	30·37
{ Central .....	27,092	13·77	9·19	2·55	25·51	30·98
{ St. George's .....	58,479	15·72	5·59	2·17	23·48	29·46
II. { Cheetham .....	40,281	9·36	0·82	1·61	11·79	14·50
{ Crumpsall .....	9,224	10·41	0·76	0·65	11·82	15·48
{ Blackley .....	9,445	14·93	0·64	1·38	16·94	17·95
{ Harpurhey .....	19,886	11·11	0·96	0·70	12·77	19·01
{ Moston .....	16,622	10·47	0·60	0·78	11·85	14·11
{ Newton .....	38,157	13·81	0·84	1·36	16·01	19·55
{ Bradford .....	24,786	17·55	1·17	1·74	20·46	23·36
{ Beswick .....	12,256	14·85	1·22	1·88	17·95	20·30
{ Clayton .....	11,536	14·13	0·69	0·78	15·60	17·18
III. { Ardwick .....	43,715	13·31	1·88	1·58	16·77	21·73
{ Openshaw .....	28,367	15·65	1·41	1·09	18·15	21·67
{ West Gorton .....	31,126	13·40	2·06	1·57	17·03	21·52
{ Rusholme and Kirk ...	26,021	12·07	1·31	1·00	14·37	16·05
{ Chorlton-on-Medlock ..	56,716	13·59	3·79	2·12	19·50	21·34
{ Hulme .....	64,756	16·34	3·66	1·76	21·76	25·42
{ Moss Side.....	27,884	10·58	0·79	0·64	12·01	...
{ Withington.....	41,703	8·32	0·60	0·34	9·26	...

\* In this table, *every death* occurring in a Public Institution has been referred to the District from which the patient originally came.  
† Exclusive of Moss Side and Withington.

The birth-rate is diminished most in North and South Manchester. In the last-named the depression is due mainly to the low birth-rates in Withington and Moss Side.

The diminution in the illegitimate rate is due, it will be seen, to North Manchester.

The death-rates exhibit great inequalities: from 24.39 per 1000 in the Manchester Township to 14.89 in North Manchester.

The greatest improvement is shown in North Manchester. As usual, the death-rate in South Manchester is intermediate between that of Central and North Manchester.

The same order of death-rate is observed in the table just given for persons dying at their own homes, which is, probably, a better measure of insanitary conditions than the total death-rate, since the home death-rate for the Central division is greatly altered by the large number of persons from common lodging-houses and from houses let in lodgings who die in the workhouses.

There is but a small difference between the home death-rates in North Manchester and South Manchester, but that is due to the inclusion of the new districts in the latter. To see how great is the difference thus caused, reference must be made to Table K.

*Death-rates from various causes in the three main divisions.*

These are given in Table K. For a proper comparison, we must use columns 2, 3, 6, and 7.

The Manchester Township has the highest death-rate under Diarrhœa, Phthisis, other Tubercular Disease, excluding Tubercular Meningitis and Tabes Mesenterica, Alcoholism, Nervous Diseases (which include Convulsions), Bronchitis, Pneumonia, Diseases of the Digestive Organs, and Old Age; also from Measles, Scarlet Fever, Influenza, and Enteric Fever. On the other hand, it has not the highest death-rate from Whooping Cough, Tubercular Meningitis and Tabes Mesenterica, Cancer, Rheumatic Fever, Urinary Diseases, or, above all, from Heart Disease. It has the lowest death-rate from Puerperal Fever and Erysipelas, a circumstance which is remarkable.

This is more than compensated for by the excess of its death-rate under Pyæmia, Septicæmia, etc.



The fact that so many of the causes of death in which the Central division has the highest death-rate are fluctuating, and the further fact that it is not highest in so many causes, appears to indicate that there is good hope of permanency in the improvement manifest in this the least Sanitary part of the City.

*South Manchester* has the highest death-rate from Whooping Cough, Puerperal Fever, Erysipelas, Tubercular Meningitis, Tabes Mesenterica, Cancer, Premature Birth, Heart Disease, and Urinary Diseases.

These causes, taken as a whole, appear to indicate a tendency to retrogression on the part of this division as compared with the Central division. In particular, the facts relating to Puerperal Fever, Erysipelas, Premature Birth, Cancer, and Heart Disease, make it desirable that attention should be given specially to the female parts of the population.

The death-rate from Alcoholism it may be observed is 0.16 per 1000, as compared with 0.05 in North Manchester.

North Manchester has the lowest death-rate from most causes. It has the highest death-rate from Rheumatic Fever alone, and the difference between the three divisions in respect of this cause is immaterial.

From these particulars we may pass to the more notable features of particular districts.

### *Statistics of Districts.*

As regards the birth-rates, these exceed 30 per 1000 in the following districts—Ancoats, St. George's, Bradford, Beswick, Clayton, Openshaw, and Hulme.

The birth-rate in Cheetham has fallen below 30 per 1000, yet the natural rate of increase is maintained, the three districts in which the natural rate of increase exceeds 17 per 1000 being Cheetham and Beswick in North Manchester, and Openshaw in South Manchester. It is the industrial districts which are still the most productive.

Referring back to Table 4, we see that while the total death-rates are highest in Ancoats, Central, and St. George's, high death-rates are recorded for Hulme and Bradford, while Beswick, Openshaw, and Chorlton-upon-Medlock have each death-rates exceeding 17 per 1000,

The home death-rates, which may be taken as a good index of sanitary condition, do not follow the same order. Bradford yields the highest home death-rate, then, in order, Hulme, Ancoats, St. George's, Blackley, Beswick, and Clayton.

The poverty index is highest for South Manchester in Hulme and Chorlton-on-Medlock, followed by West Gorton, Ardwick, Openshaw, and Rusholme.

No district in North Manchester has so high a poverty index as any of these six districts, which formerly constituted South Manchester.

This circumstance, out of accord as it is, in the case of Rusholme, with the relative conditions of the districts, leads us to the surmise that the low poverty indices of all the districts in North Manchester may be due to smallness of provision for the sick poor. This surmise is somewhat strengthened by the death-rates of persons from these districts occurring in other institutions.

Light is also thrown on the sanitary conditions of the districts by the infantile mortalities exhibited in Table H.

These exceed 190 per 1000 for each district in the Township.

In North Manchester they reach 206 per 1000 in Clayton, and 180 per 1000 in Bradford.

In South Manchester they exceed 160 per 1000 in Hulme, Chorlton-on-Medlock, Openshaw, and West Gorton. The high rate in Chorlton-on-Medlock is due to special causes.

On the whole, the highest rates are to be found in the most insanitary districts, and if the indications of the total death-rates, the home death-rates, and the infantile mortality are taken together, we can arrive at some idea of the condition of the districts.

I would, again, express my conviction that a house-to-house inspection and a house register are required, and that Bradford is a district in which such house-to-house inspection may usefully commence.

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We may next consider the *influence of sex on mortality*.

The following table shows the death-rate of males and females at all ages and at 12 groups of ages. It will be seen that in 1905, as in previous years, the death-rate in males is much greater than that in females. Moreover, this difference is exhibited at every period of life except at the ages 10-14. It is greatest at the ages of 45-54, the period of life at which alcoholism has the greatest effect.

TABLE 5.—ANNUAL RATES OF MORTALITY IN MANCHESTER IN THE YEAR 1905, AT TWELVE GROUPS OF AGES AMONGST PERSONS—MALES AND FEMALES.

GROUPS OF AGES	PERSONS			MALES			FEMALES		
	Estimated Population	Deaths	Death-rates	Estimated Population	Deaths	Death-rates	Estimated Population	Deaths	Death-rates
All Ages	631,933	11,258	17.82	303,067	5,896	19.45	328,866	5,362	16.31
0 —	71,962	4,259	59.18	35,843	2,327	64.92	36,119	19,32	53.49
5 —	64,539	296	4.59	32,065	148	4.62	32,474	148	4.56
10 —	62,203	149	2.40	31,141	71	2.28	31,062	78	2.51
15 —	63,224	226	3.57	30,318	111	3.66	32,906	115	3.49
20 —	67,610	252	3.73	31,256	129	4.13	36,354	123	3.38
25 —	112,304	674	6.00	53,258	338	6.35	59,046	336	5.69
35 —	80,898	918	11.35	39,136	488	12.47	41,762	430	10.30
45 —	56,274	1,193	21.20	26,947	675	25.05	29,327	518	17.66
55 —	33,650	1,376	40.89	15,320	706	46.08	18,330	670	36.55
65 —	14,924	1,221	81.81	6,206	586	94.42	8,718	635	72.84
75 —	4,017	580	144.39	1,474	275	186.57	2,543	305	119.94
85 +	328	114	347.56	103	42	407.77	225	72	320.00



*Influence of Age on the Death-rate.*

The following table shows the estimated populations at certain age periods, and the death-rates at those age periods, for the unaltered and for the augmented City. It will be seen that the death-rates in the City as it was before the inclusion of Moss Side and Withington, are lower than in any former year at every period of life, except at ages 5-14 and amongst persons over 65 years of age. The death-rate at ages 0-5 is the lowest of which we have any record, and the improvement at this age is the most conspicuous feature of the year. But substantial reductions are also shown at ages 15-24, 25-44, and 45-64.

## DEATH-RATES AT DIFFERENT PERIODS OF LIFE.

The death-rates at all ages and at six periods of life are shown in the following tables for the last 14 years :—

## CALCULATED POPULATIONS IN AGE GROUPS, 1891-1905.

Year	All ages	Under 5 years	5-15 years	15-25 years	25-45 years	45-65 years	65 years and upwards
1891	508,673	63,760	113,489	102,776	147,386	68,258	13,004
1892	512,135	63,776	113,289	103,682	149,087	69,040	13,261
1893	515,835	63,822	113,142	104,637	150,857	69,854	13,523
1894	519,561	63,871	113,001	105,596	152,635	70,671	13,787
1895	523,314	63,924	112,866	106,561	154,420	71,492	14,051
1896	527,094	63,980	112,736	107,532	156,214	72,316	14,316
1897	530,901	64,039	112,613	108,508	158,015	73,144	14,582
1898	534,736	64,101	112,495	109,490	159,825	73,977	14,848
1899	538,599	64,167	112,385	110,477	161,642	74,813	15,115
1900	542,490	64,236	112,276	111,471	163,471	75,653	15,383
1901	546,408	64,308	112,175	112,470	165,306	76,497	15,652
1902	550,355	64,773	112,985	113,283	166,501	77,049	15,764
1903	554,331	65,256	113,838	114,109	167,689	77,550	15,889
1904	558,335	65,752	114,714	114,953	168,893	78,037	15,986
*1905	562,346	66,254	115,595	115,803	170,089	78,522	16,083
†1905	631,933	71,962	126,742	130,834	193,202	89,924	19,269

## DEATH-RATES IN AGE GROUPS, 1891-1905.

Year	All causes	Under 5 years	5-14 years	15-24 years	25-44 years	45-64 years	65 years and upwards
1891	25·97	86·6	4·80	5·65	13·93	40·4	134·2
1892	23·22	78·7	4·59	5·37	12·06	35·9	114·4
1893	24·35	86·3	4·73	4·94	12·51	35·3	121·7
1894	19·93	66·5	3·97	4·52	11·16	29·5	100·9
1895	24·68	90·7	4·67	5·19	11·92	35·9	116·0
1896	22·53	80·4	4·08	4·89	11·22	33·3	110·9
1897	22·58	85·3	3·94	4·54	10·24	32·4	109·9
1898	21·49	78·1	3·55	4·14	10·80	32·0	104·1
1899	24·22	87·5	4·22	4·86	11·80	36·4	118·6
1900	23·79	78·3	4·21	4·63	12·52	39·7	119·4
1901	21·60	74·5	4·44	4·40	10·48	34·2	106·0
1902	20·03	64·7	4·12	4·39	10·26	33·8	99·2
1903	19·45	69·5	3·71	4·05	8·99	29·7	97·5
1904	20·89	75·8	3·71	4·15	9·40	31·3	105·5
*1905	18·74	61·9	3·75	3·87	8·77	30·3	104·9
†1905	17·82	59·2	3·51	3·65	8·24	28·6	99·4

\* Exclusive of Moss Side and Withington.

† Inclusive of Moss Side and Withington.

Table D exhibits the causes of death at ages under 3 months, at 3-5 months, and at 6-11 months, and again at ages 1, 2, 3, and 4 years.

The features of this table remain tolerably constant from year to year.

The chief causes of death under 3 months are Premature Birth and Wasting Diseases ; at 3-5 months, Diarrhœa, Lung Diseases, and Wasting Diseases ; at 6-11 months, Lung Diseases and Diarrhœa. At the age of 1 year the chief cause of death is Diarrhœa, followed by Pulmonary and Wasting Diseases.

The mortality now rapidly subsides, Lung Diseases continuing to be the most formidable single cause of death.

Whooping Cough is most fatal in the first year of life, Measles in the second, Scarlet Fever in the third and fourth, and Diphtheria in the second to fifth.

Table J furnishes a comparison of infantile mortality from a variety of causes in the City and in its three main divisions. There is nothing special to observe about the statistics for 1905, except, perhaps, the extent to which in some important respects the infantile mortality in the Manchester Township has been reduced. Especially is this noticeable under Convulsions and Wasting Diseases, causes both connected with nutrition, and possibly influenced by the instruction given in the Central part of the City.



Tables M and N show how the mortalities from particular disease groups are distributed through different age periods in the Manchester Township and in North and South Manchester.

Table M shows , under 5 years, the high death-rates from Respiratory Disease, from Diarrhoea, Measles, Whooping Cough, and Diseases of the Nervous and Digestive Systems ; at ages 5-14 years the ascent of Tubercular Disease ; at ages 15-24 years the culmination of Tubercular Disease ; at ages 25-44 years the continued prevalence of Tubercular Disease, while Cardiac and Respiratory Diseases are now strongly in evidence ; at ages 45-64 years, Cardiac and Respiratory Disease have assumed the chief place, Tubercular Disease has still progressed absolutely, but relatively has fallen back, while Cancer has taken a prominent place. At 65 years and upwards Cardiac and Respiratory Diseases have gone far ahead of other causes of death, but Cancer takes the third position.

Table N shows how these changes affect the three main divisions of the City. By far the most striking feature is the manner in which Tubercular Disease takes a more and more prominent position in the Manchester Township as age advances.

In conclusion, the great improvement in the death-rate in 1905 is, it may be hoped, an earnest of still further advance, as it should be a strong incentive, to work towards that end.

INFECTIOUS DISEASES.

The diseases included in the Infectious Disease (Notification) Acts, 1889 and 1890 are as follows : Smallpox, Scarlet Fever, Diphtheria, Membranous Croup, Typhus Fever, Enteric or Typhoid Fever, Relapsing Fever, Continued Fever, Puerperal Fever, Erysipelas, and Asiatic Cholera. The following cases were notified in 1905 and in the ten previous years, and the year 1905 is compared with the average of the previous years :—

	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	Aver'ge for 10 Years	1905
Smallpox .....	51	1	...	...	2	3	1	27	422	134	64	...
Scarlet Fever ...	2,302	2,389	1,790	897	1,467	2,507	2,692	2,282	2,012	2,063	2,040	1,905
Diphtheria.....	402	239	150	196	248	337	457	422	620	474	355	5
Memb. Croup }												
Typhus Fever ...	...	1	2	...	3	5	39	...	...	...	5	...
Enteric Fever ...	493	513	503	642	381	378	359	378	387	325	436	3
Relapsing Fever	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal Fever	33	25	49	44	35	49	55	47	30	42	41	...
Erysipelas .....	...	...	...	...	...	177	318	253	291	266	†221	3
	3,281	3,168	2,494	1,779	2,136	3,456	3,921	3,409	3,762	3,304	3,071	3,2

† Average 5 years.

The number of deaths for eleven years from the more common diseases is shown in following table, 1905 being compared with the average of the previous ten years :—

From	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	Aver'ge for 10 Years	1905
Measles ... ..	505	567	628	271	699	254	292	242	345	425	423	231
Scarlet Fever ...	173	198	124	65	46	105	127	146	97	85	117	78
Diphtheria.....	113	83	46	51	85	101	133	123	136	99	97	127
Membr. Croup }												
Enteric Fever ...	95	118	95	120	73	75	75	66	93	66	88	55
Smallpox .....	2	...	...	...	...	...	...	...	24	9	4	...
Influenza .....	194	53	107	64	219	239	99	80	62	97	121	95
Whooping Cough	250	359	299	170	227	371	224	242	213	280	264	195
	1,332	1,378	1,299	741	1,349	1,145	950	899	970	1,061	1,112	781

### SMALLPOX.

During 1905 only six cases of Smallpox occurred. Of these cases, Nos. 3, 4, and 5 are known to have been infected outside Manchester. Case No. 1 was in all probability infected from the same source as case 134, 1904. The rash of case 134 was noticed on the 25th December; that of case 1 on the 26th December. Case 1 attended a funeral on 11th December from the house of case 134. A brother-in-law of case 1 who came to the funeral stayed with case 134 from the 10th to 13th December. This brother-in-law had been discharged from Preston Smallpox Hospital three weeks before his arrival in Manchester. Case 1 infected her husband (case 2).

The source of infection in case 6, who lived near the boundary between Droylsden and Manchester, was not traced. She drank in public houses and got drunk at times, and her movements could, consequently, not be satisfactorily traced.

The following are the particulars in regard to the vaccination of these six cases, along with the dates of rash, admission and discharge from Hospital :—

	District	Sex	Age	Date of Rash	Date of Admission	Date of Discharge	Type of Disease	Vaccination Cicatrices		Complications in Hospital
								Number	Area	
1	Harpurhey .....	F.	38	26/12/04	2nd Jan.	14th Jan.	Discrete .....	4	$\frac{5}{16}$ in.	Nil
2	Harpurhey .....	M.	43	11/1/05	13th Jan.	25th Jan.	Discrete very mild...	4	1 $\frac{1}{4}$ in.	Nil
3	*Openshaw .....	F.	25	15/1/05	15th Jan.	1st Feb.	Discrete mild.....	2	$\frac{3}{4}$ in.	Nil
4	Central .....	M.	19	30/1/05	31st Jan.	15th Feb.	Discrete .....	3	2 $\frac{1}{4}$ in.	Nil
5	Ancoats .....	M.	34	31/1/05	2nd Feb.	15th Feb.	Discrete mild... ..	2	2 $\frac{1}{2}$ in.	Nil
6	Clayton .....	F.	24	19/7/05	22nd July	11th Aug.	Discrete .....	4	1 $\frac{1}{4}$ in.	Nil

\* Said to have been successfully re-vaccinated over two years ago, but her statements are very indefinite. No cicatrices present.  
 She says she was off one day from work with a bad arm.



SCARLET FEVER.

I beg to present the customary tables relating to Scarlet Fever during 1905.

Table 1 shows the attacks in weeks. The disease was most prevalent, as is usual, in the 4th quarter. A sudden rise occurred in the 33rd week, the numbers remained fairly steady for the next eight, but there was again a sudden rise to the maximum of the year in the 42nd to the 45th weeks. Thereafter, the cases decreased fairly uniformly to the end of the year.

TABLE 1.  
SCARLET FEVER, 1905.—ATTACKS IN WEEKS ACCORDING TO  
DATE OF RASH.

FIRST QUARTER			SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER				
Jan.	7	35	April	8	43	July	8	27	Oct.	7	41
„	14	26	„	15	25	„	15	33	„	14	46
„	21	34	„	22	40	„	22	27	„	21	60
„	28	45	„	29	30	„	29	39	„	28	70
Feb.	4	30	May	6	27	Aug.	5	33	Nov.	4	63
„	11	25	„	13	42	„	12	30	„	11	87
„	18	22	„	20	32	„	19	46	„	18	42
„	25	38	„	27	36	„	26	40	„	25	40
Mch.	4	32	June	3	37	Sept.	2	48	Dec.	2	53
„	11	27	„	10	40	„	9	33	„	9	38
„	18	26	„	17	34	„	16	32	„	16	28
„	25	36	„	24	43	„	23	44	„	23	24
April	1	36	July	1	34	„	30	37	„	30	39
Total... 412			Total... 463		Total... 469		Total... 631				

City Total, 1,975.

Table 2 gives the attack rate for the last 6 years. It will be seen that the number of cases notified in 1905 is smaller than the number for 1904. So that we are still at the lowest part of the long period wave. The incidence on Manchester happened to be considerably less than for the 12 notification towns, with which it is compared below.

TABLE 2.  
SCARLET FEVER ATTACKS, 1905.—RATES PER 1,000 LIVING, COMPARED  
WITH MEAN OF FIVE YEARS.

	1900	1901	1902	1903	1904	Mean	1905
Twelve Towns *	4·82	5·07	5·80	4·34	3·93	4·79	4·61
City of Manchester	4·62	4·93	4·15	3·63	3·69	4·20	3·35
Manchester Township	3·49	3·66	3·07	3·18	2·89	3·26	2·74
North Manchester	5·85	5·30	5·09	4·27	4·49	5·00	3·46
South Manchester	4·44	5·37	4·09	3·43	3·55	4·18	3·55

\* These are Blackburn, Bolton, Bradford, Burnley, Huddersfield, Hull, Leeds, Liverpool, Oldham, Preston, Salford, and Sheffield.

Table 3 shows the number of deaths out of every 100 cases occurring in each of the Sanitary Districts. The highest case-fatality is in very poor districts. The percentages of cases removed are shown by the same table to be highest in Ancoats, the Central District, Bradford, and Hulme, all of which are districts which would be specially benefited by the removal of a high proportion of cases to Hospital.

TABLE 3.  
1905—SCARLET FEVER ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1,000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats.....	159	3·62	7·5	85·5
Central .....	75	2·77	2·7	90·7
St. George's .....	121	2·07	5·8	72·8
Cheetham .....	103	2·56	3·9	63·2
Crumpsall .....	28	3·04	...	78·6
Blackley .....	23	2·44	4·3	60·9
Harpurhey .....	57	2·87	3·5	73·7
Moston .....	66	3·97	3·0	57·6
Newton Heath.....	160	4·19	1·3	71·3
Bradford .....	80	3·23	...	85·1
Beswick.....	70	5·71	4·3	81·4
Clayton.....	44	3·81	2·3	72·7
Ardwick .....	175	4·00	2·9	72·6
Openshaw .....	84	2·96	2·4	67·9
Gorton (West) .....	109	3·50	4·6	69·8
Rusholme and Kirk.....	132	5·07	3·0	47·8
Chorlton-on-Medlock .....	172	3·03	3·5	77·9
Hulme .....	223	3·44	3·1	81·6
Moss Side.....	94	3·37	5·3	60·7
<b>City of Manchester...</b>	<b>1,975</b>	<b>3·35</b>	<b>3·5</b>	<b>72·9</b>

† Corrected : the fatal cases are those actually occurring amongst the cases notified.

Table 4 gives the age distribution of 22,631 cases of Scarlet Fever, and shows the case-fatality per cent. at different ages. This is greatest in the first year of life, and declines rapidly up to the age period 10-14, after which age attacks are increasingly dangerous.

TABLE 4.

SCARLET FEVER.—NUMBER OF ATTACKS, OF DEATHS, AND CASE FATALITY PER CENT. AT DIFFERENT AGES, FOR THE ELEVEN YEARS 1894-1904, AND FOR 1905.

AGES	1894-1904			1905		
	ATTACKS	DEATHS	CASE FATALITY PER CENT.	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year ...	274	62	22·6	15	1	6·7
1 to 2 years ...	828	144	17·4	55	4	7·3
2 to 3 „ ...	1,606	221	13·8	130	9	6·9
3 to 4 „ ...	2,087	234	11·2	176	13	7·4
4 to 5 „ ...	2,429	204	8·4	175	7	7·0
5 to 6 „ ...	2,401	104	4·3	226	8	3·5
6 to 7 „ ...	2,179	76	3·5	215	9	4·2
7 to 8 „ ...	1,959	55	2·8	169	4	2·4
8 to 9 „ ...	1,607	29	1·8	152	4	2·6
9 to 10 „ ...	1,345	24	1·8	120	4	3·3
10 to 15 „ ...	3,751	57	1·5	342	5	1·5
15 to 20 „ ...	1,107	30	2·7	103	...	...
20 to 25 „ ...	511	9	1·8	45	...	...
25 to 35 „ ...	406	11	2·7	43	2	4·7
35 to 45 „ ...	106	4	3·8	8	...	...
45 to 55 „ ...	30	2	6·7	1	...	...
55 to 65 „ ...	5	...	...	...	...	...
Over 65 „ ...	...	...	...	...	...	...
All Ages .....	22,631	1,266	5·6	1,975	70	3·6

In the following table the death-rate per 1,000 in 1905 for Manchester is compared with the death-rate for 76 great towns, 141 smaller towns, rural districts, and for England and Wales. It is equal to that of the 76 great towns, but is lower than that for the smaller towns, the rural districts, and the country generally. We have not reached nearly so low a point as in 1898 and 1899, the last period of ebb.



TABLE 5.  
SCARLET FEVER MORTALITY, 1905.—RATE PER 1000 LIVING, COMPARED  
WITH MEAN OF FIVE YEARS.

	1900	1901	1902	1903	1904	Mean	1905
England and Wales.....	0·11	0·13	0·19	0·12	0·11	<b>0·13</b>	0·11
* 76 Great Towns .....	0·13	0·17	0·19	0·14	0·12	<b>0·15</b>	0·13
London.....	0·08	0·13	0·12	0·08	0·08	<b>0·10</b>	0·12
<b>Manchester City</b> .....	0·19	0·23	0·27	0·17	0·15	<b>0·20</b>	0·13†
Manchester Township .....	0·16	0·24	0·21	0·14	0·17	<b>0·18</b>	0·15
North Manchester .....	0·24	0·25	0·31	0·21	0·16	<b>0·23</b>	0·10
South Manchester .....	0·18	0·22	0·26	0·17	0·14	<b>0·19</b>	0·15†
* 141 Smaller Towns .....	0·12	0·14	0·14	0·12	0·13	<b>0·13</b>	0·11
Rural Districts.....	0·10	0·10	0·10	0·10	0·09	<b>0·10</b>	0·09

\* The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns, and for 1902-3 for 103 Smaller Towns. † Exclusive of Moss Side and Withington.

TABLE 6.—SCARLET FEVER.

		1891	1892	1893	1894	1895	1896	1897	1898
Manchester Township.	Removal to Hospital, per cent. ....	72·3	71·1	76·3	79·1	82·0	83·5	89·2	85·8
	Death-rate per 1,000...	0·22	0·35	0·23	0·26	0·37	0·41	0·27	0·11
City.	Removal to Hospital, per cent. ....	61·1	58·5	58·6	66·0	71·3	73·9	79·7	73·1
	Death-rate per 1,000...	0·22	0·27	0·27	0·22	0·33	0·37	0·23	0·12
		1899	1900	1901	1902	1903	1904	1905	...
Manchester Township.	Removal to Hospital, per cent.....	87·2	88·0	88·5	88·8	91·9	88·6	82·3	...
	Death-rate per 1,000...	0·08	0·16	0·24	0·21	0·14	0·17	0·15	...
City.	Removal to Hospital, per cent.....	74·4	80·9	82·3	81·2	83·4	79·8	72·9	..
	Death-rate per 1,000...	0·08	0·19	0·23	0·27	0·17	0·15	0·13	...

Table 6 shows the extent to which Monsall Hospital has been used by the central portion of the City, and by the City as a whole. The proportion of cases removed is highest in the former, as it ought to be. It will be seen that the proportion is less in 1905 than in other years since 1895. This is owing to the effort made to limit the numbers admitted, owing to want of sufficient accommodation.

## RETURN CASES OF SCARLET FEVER.

BY DUNCAN FORBES, M.D.

As in 1904, all subsequent cases occurring at houses after the return of a Scarlet Fever case to that house are noted. If any of those cases are considered not to be return cases, the reason for coming to such a conclusion is given.

Table A has been prepared, giving the durations of stay in hospital of all cases of Scarlet Fever discharged from Monsall Hospital during 1905, also the durations of stay in hospital of those cases which gave rise to return cases. The percentages are worked out to the nearest whole number. One would expect to find an increasing proportion of complicated cases the longer the duration of stay in hospital. Table B gives the numbers of uncomplicated cases of the total number of originating cases. This information is derived from the hospital note.

So far as those figures in Tables A and B go, they seem to indicate that if a case is uncomplicated, there is no advantage to be gained in keeping it in hospital after the fifth week. When the seventh week has gone, it would seem to be advantageous to keep the cases in hospital over prolonged periods. Probably the congested but healing throat is not so readily infected from outside as the throat which has got over its first congestion.

The cases sent out with slightly congested throats in the fifth and sixth weeks, although slightly infectious, probably get rapidly better at home, while those kept in hospital for a longer period are reinfected, and it is only by very prolonged treatment that the infection is got rid of.

For those cases which have to be detained in hospital after the fifth week, everything points to its separation from all other patients until it can be sent home.

Table C gives the intervals intervening between the rashes of the originating and return cases in weeks.

Table D gives the intervals intervening in days between the return home of the originating and the rash of the return case.

Tables C and D taken together point to the danger from cases kept in hospital from 7 to 8 weeks after the rash.

Table D shows the danger from the discharged case is chiefly to be feared in the first fortnight after its return from hospital.

The lists of cases which follow show the close contact of the originating with the return case in many instances.\*

The condition of the originating case is given, but a comparison would have to be made with the condition of all discharged cases after similar intervals of time.

TABLE A.

<i>Duration of stay in days.</i>	-7	-14	-21	-28	-35	-42	-49	-56	-63	-70	-77	-84	-112	-140	-168	168+
Total number of Scarlet Fever cases discharged from Monsall Hospital during 1905 .. ..	..	2	1	10	83	138	359	237	159	106	55	48	122	61	23	45
Number of discharged patients giving rise to Return Cases .. ..	..	..	..	..	4	5	14	16	5	7	3	5	5	2	1	..
Percentage number of discharged patients giving rise to Return Cases .. ..	..	..	..	..	5	4	4	7	3	7	5	10	4	3	4	..

\* This Table has been omitted on account of space.



TABLE B.

3 originating cases out of			4 discharged in the 5th week were uncomplicated.		
4	„	5	„	6th	„
10	„	14	„	7th	„
9	„	16	„	8th	„
3	„	5	„	9th	„
2	„	23 discharged after the 9th week were uncomplicated.			

TABLE C.

Intervals in weeks	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	21+
Figures for 1904 . .	12	12	18	27	17	21	12	10	7	3	3	2	1	2	2	4	2
Figures for 1905 .	1	4	4	12	12	7	5	5	5	3	4	3	5	..	2	3	1

TABLE D.

Figures for 1904	..	..	..	..	..	..	..	47	38	23	13	11	6	..	..	..	..
Figures for 1905	..	..	..	..	..	..	..	17	24	11	13	1	4	2	3	1	4
								-7	-14	-21	-31	-41	-51	-61	-71	-81	81+

## DIPHTHERIA, 1905.

The usual particulars regarding cases of Diphtheria and Membranous Croup notified during the year are shown in the following tables. The number of cases notified in 1905 is greater than the number in 1904, and it would appear as if Diphtheria were about to resume the marked increase which it showed from 1897 to 1903. The number of deaths in 1905 has also increased.

By comparison with other towns, and with England and Wales generally, the death-rate in Manchester shows an increase. The Sanitary Districts showing special prevalence of the disease in 1905 were:—Cheetham, Crumpsall, St. George's, Ancoats, the Central District, Chorlton-on-Medlock, Openshaw, Clayton, and Rusholme.

These by no means coincide with the districts most affected in 1904, and it is clear that temporary causes have much to do with the prevalence of this disease.

In 1904 the disease was most prevalent in the fourth quarter, while in 1905 it is most prevalent in the first, and then in the third quarter.

The following are the tables relating to Diphtheria and Membranous Croup during the year 1905:—

DIPHTHERIA, MEMB. CROUP, 1905.—ATTACKS IN WEEKS, ACCORDING TO  
DATE OF ONSET.

FIRST QUARTER			SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER				
Jan.	7	15	April	8	13	July	8	4	Oct.	7	15
„	14	15	„	15	10	„	15	6	„	14	6
„	21	8	„	22	14	„	22	9	„	21	13
„	28	14	„	29	11	„	29	4	„	28	5
Feb.	4	11	May	6	3	Aug.	5	9	Nov.	4	10
„	11	21	„	13	8	„	12	11	„	11	12
„	18	12	„	20	8	„	19	8	„	18	10
„	25	11	„	27	6	„	26	11	„	25	12
Mch.	4	8	June	3	5	Sept.	2	8	Dec.	2	7
„	11	19	„	10	9	„	9	10	„	9	11
„	18	12	„	17	4	„	16	19	„	16	9
„	25	17	„	24	5	„	23	12	„	23	12
April	1	10	July	1	4	„	30	12	„	30	12
Total...	173		Total...	100		Total...	123		Total...	134	

City total, 530.

DIPHThERIA AND MEMB. CROUP ATTACKS, 1905.—RATES PER 1000  
LIVING, COMPARED WITH MEAN OF FIVE YEARS. .

	1900	1901	1902	1903	1904	Mean	1905
Twelve Notification Towns ...	1·89	1·67	1·51	1·20	1·35	<b>1·52</b>	1·25
<b>City of Manchester</b> .....	0·62	0·84	0·77	1·12	0·85	<b>0·84</b>	0·90
Manchester Township.....	0·34	0·58	0·61	0·54	0·59	<b>0·53</b>	0·90
North Manchester .....	1·14	1·10	0·78	1·32	0·95	<b>1·06</b>	0·89
South Manchester .....	0·44	0·79	0·84	1·28	0·91	<b>0·85</b>	0·90

DIPHThERIA, MEMB. CROUP, 1905.—NUMBER OF ATTACKS, OF DEATHS,  
AND CASE FATALITY AT DIFFERENT AGES, FOR THE ELEVEN YEARS  
1894-1904. AND FOR 1905.

AGES	1894-1904			1905		
	ATTACKS	DEATHS	CASE FATALITY*	ATTACKS	DEATHS	CASE FATALITY*
Under one year ...	125	81	64·9	14	9	64·3
1 to 2 years ...	337	187	55·5	42	17	40·4
2 to 3 „ ...	354	169	47·7	42	14	33·3
3 to 4 „ ...	461	172	37·3	64	22	34·4
4 to 5 „ ...	435	149	34·2	63	10	15·9
5 to 6 „ ...	372	117	31·4	66	16	24·2
6 to 7 „ ...	258	65	25·2	37	4	10·8
7 to 8 „ ...	228	47	20·6	23	7	30·4
8 to 9 „ ...	181	36	19·9	35	10	28·6
9 to 10 „ ...	144	18	12·5	23	4	17·4
10 to 15 „ ...	403	32	7·9	51	3	5·9
15 to 20 „ ...	201	9	4·5	21	2	9·5
20 to 25 „ ...	182	5	2·7	16	...	...
25 to 35 „ ...	238	10	4·2	23	...	...
35 to 45 „ ...	92	4	4·3	5	...	...
45 to 55 „ ...	33	2	6·1	1	...	...
55 to 65 „ ...	7	...	...	4	1	25·0
Over 65 „ ...	6	...	...	...	...	...
All ages .....	4057	1103	27·2	530	119	22·4

\* The percentages in this column are the actual proportions of fatal cases to the attacks at those ages.



DIPHTHERIA AND MEMBRANOUS CROUP, 1905.—ATTACKS IN DISTRICTS,  
WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO  
HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats .....	42	0·96	33·3	80·9
Central .....	24	0·89	25·0	70·8
St. George's .....	51	0·87	23·5	58·8
Cheetham .....	75	1·86	9·3	64·0
Crumpsall .....	11	1·19	45·5	54·6
Blackley .....	7	0·74	28·6	71·4
Harpurhey .....	8	0·40	25·0	37·5
Moston .....	5	0·30	...	20·0
Newton Heath.....	28	0·73	35·7	71·4
Bradford .....	16	0·65	25·0	31·2
Beswick .....	3	0·25	33·3	66·6
Clayton .....	10	0·87	20·0	20·0
Ardwick .....	27	0·62	25·9	55·5
Openshaw .....	29	1·02	27·6	31·0
Gorton (West) .....	13	0·42	15·4	38·5
Rusholme and Kirk.	32	1·23	15·6	43·7
Chorlton-on-Medlock	73	1·29	20·5	64·4
Hulme .....	58	0·90	25·8	53·4
Moss Side .....	18	0·65	11·1	11·1
<b>City of Manchester</b>	<b>530</b>	<b>0·90</b>	<b>22·4</b>	<b>57·3</b>

† Corrected: the fatal cases are those actually occurring amongst the cases notified.

DIPHTHERIA, MEMB. CROUP MORTALITY, 1905.—RATE PER 1000 LIVING  
COMPARED WITH MEAN OF FIVE YEARS.

	1900	1901	1902	1903	1904	Mean	1905
England and Wales .....	0·27	0·27	0·23	0·18	0·17	<b>0·22</b>	0·16
*76 Great Towns .....	0·35	0·30	0·26	0·20	0·19	<b>0·26</b>	0·16
London .....	0·34	0·30	0·25	0·16	0·16	<b>0·24</b>	0·12
<b>Manchester City</b> .....	0·19	0·24	0·22	0·25	0·18	<b>0·22</b>	†0·22
Manchester Township .....	0·18	0·16	0·19	0·16	0·13	<b>0·16</b>	0·25
North Manchester .....	0·23	0·30	0·21	0·26	0·22	<b>0·24</b>	0·19
South Manchester .....	0·16	0·25	0·25	0·28	0·17	<b>0·22</b>	†0·22
*141 Smaller Towns .....	0·29	0·28	0·24	0·16	0·16	<b>0·23</b>	0·15
Rural Districts .....	0·23	0·24	0·20	0·17	0·14	<b>0·20</b>	0·15

\* The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns; and for 1902 and 1903, 103 Smaller Towns. † Exclusive of Moss Side and Withington.

No. of cases occurring in each month of year, according as the swabs gave positive and negative results, or as no swabs were taken :—

Bacteriological Results	January	February	March	April	May	June	July	August	September	October	November	December	Total
Positive....	48	38	45	35	19	15	22	27	44	29	28	22	372
Negative ..	8	9	12	10	7	4	4	9	8	11	13	6	101
No swab....	8	5	4	5	2	3	2	4	4	4	4	10	55
													<u>528</u>

The increased prevalence of the disease during the last three years, coupled with its high fatality, makes it necessary to give increased attention to its modes of propagation.

In 1905 the case fatality was 22·4 per cent., as compared with an average case fatality for the years 1894–1904 of 27·2 per cent.—a marked improvement. The death-rate per 1,000 was 0·22, which was identical with the mean death-rate for the years 1900–1904. Relatively to that of other towns, and of the country generally, however, the death-rate in 1905 is retrogressive.

Practitioners were again urged by circular letter, while confirming the nature of their cases by bacteriological examination, not to wait for the result, but to inject antitoxin as soon as possible after their suspicions were aroused as to the nature of the disease. Both injecting syringe and antitoxin are at their service at the Public Health Office, while after office hours and at week ends antitoxin may be obtained from the Detective Office at the Town Hall.

It is generally accepted that, unless antitoxin is administered within the first three days, it is of comparatively little value.

If we could, by sufficient promptitude in treatment, avert the fatal issue of Diphtheria, we should be fulfilling one of the aims of the Public Health Act. It is difficult to see how a medical man can be relieved of responsibility if he fails to save a child under his care suffering from Diphtheria if the fatal issue can be averted by injection of a sufficient amount of antitoxin within the first three days.

If this expectation is a vain one, and antitoxin is not capable of fulfilling such a claim, we ought to know that these statements are not reliable.

Meantime, we are bound by the numerous statements from clinical observers which have been published to act on the view that antitoxin has a high curative power, if given early enough.

Letters have, therefore, in recent months, been sent to practitioners when it is doubtful whether the antitoxin treatment has been pursued.

The distribution of cases of Diphtheria notified in 1905, in Sanitary Districts, is shown in the following picture table. This exhibits the cases in months. When the bacteriological examination has been positive it is marked •, † stands for a case giving no growth of Diphtheria bacilli, and o indicates that no specimen has been taken. These signs † ? § mark cases of Membranous Croup, the first showing that the specimen taken has given a +<sup>ve</sup> result, the second that no specimen was taken, and the third that the specimen taken gave a —<sup>ve</sup> result.

#### *Bacteriological Statement.*

This table, it will be seen, exhibits the bacteriology as well as the distribution of Diphtheria in 1905. It will be convenient here to complete what there is to say on the subject of the bacteriology of Diphtheria. The number of cases notified by no means represents the number of swabs taken. In any case admitting of doubt, medical attendants may take swabs and send them to the College. If no Diphtheria bacilli are found, their further opinion of the case is requested; and only if the diagnosis of Diphtheria is affirmed after receipt of the result of bacteriological examination is the case entered in the books as Diphtheria. The number of specimens thus examined in 1905 was 1338, and of these 868 were put aside for the reason named.

Of those giving a negative result, and affirmed to be Diphtheria, some are treated at home and some are sent to Monsall Hospital.

Of 75 sent to Monsall Hospital, 22 were diagnosed as being disease other than Diphtheria. It may be here remarked that a number of cases sent to Monsall Hospital gave subsequent negative results, and two are marked doubtful.

Altogether, of the 97 negative cases left, I feel at liberty to reject 19, mostly among cases treated at home, leaving 78 negative cases. We may, however, feel assured that a portion of these, also, were not cases of Diphtheria, though what portion I have no means of gauging.



1905.—DIPHTHERIA.

IN THIS TABLE ARE INCLUDED ALL CASES, EXCEPT THOSE DIAGNOSED AT MONSALL AS NOT DIPHTHERIA TO THE NUMBER OF 528.

STATISTICAL DIVISIONS		January	February	March	April	May	June	July	August	September	October	November	December
I. Ancoats .....		..... o †	..... ♀ †††	.....	.. ††	♀	.. †	•	.. †††	• †	• ♀	• †	..
Central .....		• o	• †	... †	•	• ♀ †	...	...	.. †	.. †	o §	...	• †
St. George's.....		... o	.... †	..... †	..... †	..	...	..	.. †	..... ♀	...	.... o †	• †
Cheetham.....		..... ††	.....	..... ††††	... o †	... ††	.... ♀ †	.. o ††	.. ♀ o †	..	• †††	.... ††††	.. ††
Crumpsall... ..		♀	...	...	•	...	...	...	...	• †	..	...	.... o
Blackley .....		♀	...	...	•	†	†	...	•	...	...	...	o
Harpurhey .....		•	...	...	...	•	...	...	..	†	•	...	...
II. Moston .....		•	o §	♀ †	...	...	...	...	...	...	...	...	...
Newton.....		....	.. ♀	... o	...	• ♀	...	•	...	...	† §	♀ †	... o ♀
Bradford .....		†	•	• †	♀ †	...	...	•	..	...	.. ♀	...	...
Beswick .....		...	...	•	...	...	...	•	...	...	...	•	...
Clayton.....		•	•	•	..	...	•	•	...	...	...	• †	•
Ardwick .....		...	..	• o †	..... o	• oo	...	•	..	....	... †	• †	♀
Openshaw .....		..	...	•	... §	•	o	..... ♀	•	.. ♀	..	...	.... ♀
West Gorton .....		...	.. †	... †	.. †	...	...	...	...	...	o	•	†
III. Rusholme and Kirkmanshulme.....		• ♀ †	.. o	..... † §	.. †	...	•	..	o	•	....	..	ooo
Chorlton-upon-Medlock .....		..... o	..... ♀ †	...	•	...	...	.. o	....	..... ooo †††	..... †† §	.. ♀ †††	†
Hulme ..		... ooo †††	.... o †	... o	††	• †††	.... o	• ††	.... †	.... †	... o	..... o †	.... ♀
Moss Side.....		..	•	...	.. oo	..	†	•	• oo ††	...	• †	...	...



Rejecting, however, only the 22 cases diagnosed at Monsall as disease other than Diphtheria, we get the following classification of cases :—

Bacteriology.

+ve.			- ve.		No Swab		
Home	Ancoats Hospital	Monsall	Home	Monsall	Home	Monsall	
Recovered	Died	Recovered	Recovered	Recooered	Recovered	Recovered	
Died	Died	Died	Died	Died	Died	Died	
110		200	35	44	19	4	
20		42	9	9	30	5	
<div><div></div></div>		<div><div></div></div>		<div><div></div></div>		<div><div></div></div>	
130	1	242	44	53	49	9	
Total.... 528.							



While, however, it is to be expected that a certain proportion of the cases retained are not Diphtheria, it may also happen that a certain proportion of those accepted as not Diphtheria should in reality not be withdrawn. How to avert this danger with our present means of investigation I do not know. To exercise any control over the negative cases requires very full study of the incidence of cases on districts, in schools, etc., carefully maintained. The labour would be great, though the results would be useful. Meanwhile, we have to rely on very careful bacteriological examinations, as interpreted by the medical attendant, and it may be presumed that the cases allowed to escape are only occasional.

The local incidence of outbursts of Diphtheria, and the occurrence of explosive outbreaks limited to particular months, is shown in this as in previous similar tables.

Outbursts are marked in :—

Ancoats .. .. .	January to March.
St. George's .. .. .	March and April.
Cheetham .. .. .	January to March.
Ardwick .. .. .	April, and September to October.
Openshaw .. .. .	July.
Rusholme .. .. .	March.
Chorlton-on-Medlock .. .. .	January to March, and again in August, September, and October.

The manner of occurrence of these outbreaks suggests local infections, which are confined to no season of the year, though there is a somewhat reduced occurrence of these in the second quarter. In addition, however, there are isolated cases dotted about the districts, and unless these can be brought into some association with cases in other districts, we must infer the existence of overlooked cases, or of centres of infection.

Now there is no doubt that the bacilli of Diphtheria are widely distributed. If a school is selected, in which there is not known to be any case of Diphtheria, and a number of swabs are taken at random and submitted to bacteriological examination, a certain percentage of them is always found to yield Diphtheria bacilli, although the investigations made at Cambridge and elsewhere show that there are a number of organisms which may simulate the Diphtheria bacillus.

If these specimens are taken from a class in which Diphtheria has made its appearance, the proportion yielding Diphtheria bacilli is generally increased, and the proportion is still greater when the specimens are taken from contacts with cases of Diphtheria occurring in the same family.

There is, therefore, no doubt that many persons harbour Diphtheria bacilli without apparently suffering at all from the disease.

If we take the affection as it shows itself in the throat, we find that very often, in the same family, concurrently with well-marked attacks, there are others having only very slight sore throats, who are no doubt suffering from Diphtheria.

Then, again, nasal Diphtheria may give rise to very little disturbance, and there may be no enlargement of associated glands.

*All these are conditions which a Sanitary Inspector cannot be expected to ascertain or to deal with, yet to discover them and prevent them from remaining sources of danger is of the essence of the prevention of Diphtheria.*

What is required for Diphtheria, and also for Scarlet Fever, is a Medical Investigator, who would be able to make the requisite investigation rapidly, and to administer preventive doses of antitoxin when requisite. He would also take swabs for examination, and, if need be, cultivate and examine these.

The power of isolation in hospital to limit the spread or fatality of Scarlet Fever and Diphtheria is but limited, and more preventive value could be got, in my opinion, by increasing the staff of the Medical Officer of Health.

Yet I do not feel able to lay down any plan for diminishing the incidence of Diphtheria. Careful inquiry would, no doubt, of itself bring with it measures for the diminution of Diphtheria, as it has done in the case of Enteric.

A limited amount of antitoxin administration in children, as suggested by Dr. Forbes, might be productive of some benefit.

More is probably to be looked for from the withdrawal from school of contacts showing the presence of Diphtheria bacilli in the throat and nose. As for the wholesale isolation of contacts, I do not believe it to be practicable here, and I am not clear that it is desirable.

If, now, we are to make substantial progress, whether by the aid of a special Medical Investigator or otherwise, we must have some ideas with which to start on our fuller inquiries. I have already indicated that in all probability a fuller investigation would bring together the many cases which now appear isolated, as parts of a series of chains, the links of which are at present lying concealed, and we should then see how they came into their places ; very likely we should then be able to do much to avert their occurrence.

It is true very successful results have been attained by assuming that the disease is being propagated by overlooked attacks, or merely by the harbouring of bacilli in persons who have been in contact with others definitely assailed.



But this is not conclusive, since in the absence of the special and troublesome methods adopted such outbreaks have a habit of dropping spontaneously, as may be seen from the picture tables for 1905 and former years.

However imperfect our present investigations may be, it seems desirable to utilise them with a view to ascertain what are the probable means of conveyance, more particularly with a view to a fresh departure.

For this purpose we have at our disposal the following particulars :—

1. The Inspectors' forms, which give the occupations (including school work) of every member of a family attacked, with the places of work (including particular schools). These forms give also the histories of infection, so far as ascertained.

2. A register for Diphtheria of schools in which cases have occurred, giving the dates of the onset of every case at the particular school.

We may usefully examine these to see what can be ascertained from them.

It may be said at once that no clear indication is afforded by these reports of any cause of Diphtheria other than the occurrence of previous cases, and they will be used purely to enquire into the relations of such occurrence.

We may commence with the cases in which a relation to previous known cases has been ascertained.

I have made a complete tabulation of these, and in 1905 they number 147 cases of Diphtheria and 1 of Membranous Croup, without counting those in which cases have been recently notified from the immediate neighbourhood. The latter number 11. In a few, the period between exposure and the development of symptoms exceeds a week. But, in my opinion, these limits have been laid down with an arbitrariness which the facts do not justify. As we have seen, Diphtheria bacilli may be present in the throat or nose and yet not produce the disease Diphtheria. In the same way, they may be present and the attack may be delayed because of initial want of susceptibility in the mucous membrane. No good purpose would be served by detailing the histories of these infections. One or two exceptional cases, however, may be noted.

Case 35 had three playmates, the sister of whom was suffering from Diphtheria. There is no evidence that any of the 3 playmates themselves suffered from the disease.

Case 72. At the time when this child was infected there were two cases next door, but no evidence of contact.

Case 168. A playmate of the brothers of this child was removed to hospital suffering from Diphtheria two days before the onset of the disease.



Case 199. From a playmate who has recovered from Diphtheria.

Case 251. From a playmate who has recovered.

Case 320. Onset August 13th. A child died from Scarlet Fever next door on August 11th.

Case 441 was playmate of a child whose sister was discharged from hospital on October 17th. Both developed Diphtheria, one on November 4th and the other on November 5th. There was probably an intermediate case.

As regards infection from return cases, this in 1905 is almost negligible.

Case 19. Onset January 7th. Child age 5 discharged after Scarlet Fever, eight weeks before.

Case 96. Onset February 23rd. Diphtheria case, discharged January 3rd. The interval is considerable. It is true a specimen from the discharged case gave +<sup>ve</sup> results, but this may be interpreted as due to the occurrence of Diphtheria in case 96.

Case 101. Onset February 24th. Another child had Diphtheria, was removed to hospital, and discharged on February 14th. But the mother commenced with what was evidently an attack of overlooked Diphtheria on January 6th.

Case 173. Onset March 28th. A brother had Diphtheria on March 7th. On February 28th, a case was discharged from hospital after Scarlet Fever.

Case 188. Onset April 10th. A case of Scarlet Fever was discharged on March 14th.

Case 214. Onset April 24th. A sister was discharged after Scarlet Fever on April 18th.

Case 238. Onset May 15th. A sister was discharged after Scarlet Fever on April 4th.

Case 328. Onset August 21st. A brother returned home after Scarlet Fever on August 18th.

Case 446. Onset November 5th. Sister in hospital with Diphtheria; returned home on October 17th.

The last four cases are more likely than the previous five to have been due to cases discharged from hospital, but the number is too small to draw conclusions from. In 1904 there could be no doubt about the occurrence of return cases, on which Dr. Forbes made a special report.

We have now to consider the remaining cases.

There is no doubt at all that school plays a considerable part in the propagation of Scarlet Fever and Diphtheria.

This is clearly shown by Sir Shirley Murphy's investigations. He has shown that in the annual curves exhibiting the number of cases of Scarlet Fever and Diphtheria, week by week, there is a depression coinciding with the annual holiday, and he has also shown that this depression is due to diminution in the number of school children attacked, and not to the diminution of attacks occurring at an earlier or later age.

It would seem, therefore, that attendance at school does cause an appreciable amount of spread, as we might expect. Our mode of inquiry has been to keep a register of cases occurring at different schools, giving for each case the class attended, and the date of onset of the attack. The history of each school as regards known cases of the disease is thus seen at a glance, and in many instances a confident opinion can be formed that disease has spread in a particular school. In a still larger number, however, there is doubt, owing to the smallness of the numbers attacked. By Sir Shirley Murphy's method these doubts are put aside.

Not only so, but the method also takes account of the infection caused at school by contacts or by overlooked attacks, which does not appear in the register. Sir Shirley Murphy's curve, in fact, gives the means of determining the number of known cases infected at school, or would do so if the holidays always coincided in point of time.

We are not, however, entirely without means of tracing the latent influences of school. It has been explained that the Inspector's sheet gives the name of the school for each child in a family invaded by Diphtheria. If, then, the disease has attacked a member of a family not attending school, and we cannot trace the source, but can say that the school attended by other children in the same family has been recently invaded by Diphtheria, occurring in those classes to which the children belong, a presumption is created that the disease has been carried home from school, even if no pronounced illness has been observed in those children.

I propose, now, to go through the schools attended by school children, and ascertain in how many instances infection probably was contracted at school.

Applying the conditions that the infecting and infected cases must be in the same departments, though accepting the girls and infants as one department for this inquiry, and that the interval between two cases supposed to be connected must not materially exceed one month, we find that 49 children probably received their infection in school.

Of these, one school in Chorlton-on-Medlock had 9 and one in Crumpsall had 6 cases who, probably, contracted the disease at school,

Both these were in the latter end of the year.



Two schools in Cheetham had, in the first half of the year, one 6, the other 4. The former had also one case towards the end of the year.

A school in Ardwick had 3, one in Hulme had 4, and one in St. George's had 3.

Four had 2 each, and four had one each.

These, be it remembered, were not the numbers of cases occurring in the schools affected, which in some cases were considerable, but the numbers which, on careful consideration, might be considered as probably having received infection at school.

The number of these schools having more than one case traced with probability to the school supports the belief that a substantial amount of infection is received there.

The number of cases of Diphtheria attending school in 1905 was 248, or, including membranous croup, 258.

Of these, 68 were traced to previous cases, so that the origin of 117 out of the 258 may be considered to have been ascertained.

I have also gone carefully through the cases not attending school, and extracted the schools attended by members of the family not attacked. I have, then, referred in each case to the school register, and to the history of the case. A note has been made of each case not attending school which is not traceable to other sources, and which may be supposed either to have been due to an overlooked attack in the children attending school, or to have given rise by means of such cases to attacks at the school which other members of the family attended.

The total number of such cases is 35.

We may, therefore, suppose that school life was possibly connected with the origin of 84 attacks.

If this should seem a very large proportion out of 528 attacks, or more strictly 509, it is to be remembered that this does not measure the number by which Diphtheria would have been diminished in the absence of school, nor does it correspond to the depression given by the holidays in Sir Shirley Murphy's curve. No doubt many cases out of those attacked would have occurred in any case, school or no school. The curve takes account of this fact. The above figures do not.

That there should be so many cases connected with school as there are is due, no doubt, to the use of common drinking taps, common towels, common slates, and also, in some measure, to the use of common closets.

Infection to some extent must occur whenever children are collected in numbers.

It is, all the same, important that it should be diminished as far as possible, by the use of proper drinking and washing arrangements, and by the substitution of paper for slates.



Cases not connected with any previous case number 184, of whom 83 were in families containing no school children.

It will be seen that there is still much to be learned about the mode of spread of Diphtheria, and, therefore, about the measures to be taken for its prevention. The necessary inquiries can only be conducted, however, with special medical assistance.

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## ENTERIC FEVER.

The following tables give a number of particulars in reference to this disease.

On reference to Table 5 it will be seen that, taking one year with another, the heaviest incidence of the disease, so far as the notification figures go, falls on the ages 10 to 45. It is thus one of those diseases which are economically important.

Table 5 also shews that it is most fatal to those attacked in early childhood. The risk from an attack diminishes up to about the age of 10. It then becomes more fatal with advancing age, and exacts a heavy tribute from adult life.

It will be seen in the course of the following article that there is reason to believe that its incidence on childhood is heavier than is generally recognised, with the result that more adults are attacked than need be the case, if the possibility that Diarrhoeal attacks in young children are in reality Enteric Fever were carefully borne in mind.

Table 6 shows that the death-rate in 1905 was the lowest on record, a circumstance which may, in part, be due to the increased attention bestowed on the disease during the last two years. There is, however, a factor in the production of Enteric Fever which is at present out of our reach, viz., the introduction of contaminated articles of food, especially of shellfish. The death-rate was equal to that of England and Wales generally.

On reference to Table 1, it will be noted that the greatest incidence of the disease was on the first and fourth quarters. The varying incidence on different seasons, in different years, depends no doubt on the shares borne in the spread of the disease by various factors, such as direct infection, fly-borne infection, and shellfish. Comparatively heavy incidence on the first and fourth quarters would indicate a relatively large share of shellfish in the result.

If fly-borne infection is an important factor, we should expect that the incidence of the disease would be comparatively heavy in the third quarter in those years in which the death-rate from Summer Diarrhoea in this quarter was excessive. This is very strikingly the case in 1897, 1898, and again in 1901. It is not the case in 1899, although the disease in that year does show a great excess of deaths in the third quarter over the number occurring in the second.

Table 3 shows that the number of cases notified and ascertained yields a rate of cases per 1,000 of population lower than in any recent year except 1904.

If it should prove possible to maintain the recent energy of investigation, it may be possible to depress the disease still further.

To maintain that depression, however, will require the substitution of water-closets for middens and pails.

Following on the tables will be found a full account of the enquiries made relative to the cases of Enteric Fever in 1905. This investigation is given in detail so as to indicate precisely what the statements mean, and to enable those conversant with the disease to judge how far the following conclusion is borne out.

In Manchester, Enteric Fever is spread chiefly in two ways :—

(1) By the transmission of fæcal matter from one person to another living within a short distance away. It is for the most part conveyed in food, which may be contaminated from a previous case in the house, or from previous cases outside the house.

(2) By imported foods, and especially by contaminated mussels.

I.—ENTERIC FEVER ATTACKS REPORTED IN QUARTERS.

	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
1891 .....	173	119	180	289
1892 .....	164	106	156	184
1893 .....	108	80	220	210
1894 .....	118	75	135	132
1895 ... ..	110	90	100	193
1896 .....	118	130	108	157
1897 .....	97	57	137	212
1898 .....	143	79	134	286
1899 .....	101	66	104	110
1900 .....	85	78	103	112
1901 .....	43	43	149	124
1902 .....	63	82	111	122
1903 .....	90	82	87	128
1904 .....	69	68	105	83
1905 .....	111	62	71	101

2.—ENTERIC FEVER ATTACKS IN WEEKS REPORTED IN 1905, ACCORDING TO DATE OF ONSET.

FIRST QUARTER		SECOND QUARTER		THIRD QUARTER		FOURTH QUARTER	
Jan. 7	9	Apl. 8	7	July 8	1	Oct. 7	13
„ 14	11	„ 15	11	„ 15	1	„ 14	6
„ 21	7	„ 22	5	„ 22	...	„ 21	12
„ 28	12	„ 29	6	„ 29	7	„ 28	9
Feb. 4	12	May 6	8	Aug. 5	2	Nov. 4	10
„ 11	3	„ 13	6	„ 12	4	„ 11	4
„ 18	5	„ 20	4	„ 19	9	„ 18	10
„ 25	5	„ 27	4	„ 26	8	„ 25	4
Mch. 4	9	June 3	1	Sept. 2	8	Dec. 2	6
„ 11	10	„ 10	1	„ 9	6	„ 9	6
„ 18	12	„ 17	4	„ 16	7	„ 16	8
„ 25	9	„ 24	3	„ 23	11	„ 23	6
April 1	7	July 1	2	„ 30	7	„ 30	7
Total..	111	Total...	62	Total...	71	Total...	101

City Total ... .. 345

3.—ENTERIC FEVER ATTACKS, 1905.—RATES PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1900	1901	1902	1903	1904	Mean	1905
Twelve Notification Towns...	1·12	1·26	1·01	0·81	0·71	0·98	0·61
City of Manchester.....	0·70	0·66	0·69	0·70	0·58	0·67	0·59
Manchester Township.....	0·65	0·65	0·80	0·77	0·82	0·74	0·66
North Manchester .....	0·80	0·77	0·85	0·59	0·56	0·71	0·58
South Manchester .....	0·65	0·58	0·52	0·73	0·47	0·59	0·55



4.—ENTERIC FEVER, 1905.—NUMBER OF ATTACKS IN DISTRICTS, WITH ATTACK RATE, CASE FATALITY PER CENT., AND REMOVALS TO HOSPITAL PER CENT.

DISTRICTS	ATTACKS	ATTACK RATE PER 1,000 LIVING	† CASE FATALITY PER CENT.	REMOVALS TO HOSPITAL PER CENT.
Ancoats .....	26	0·59	15·4	76·9
Central .....	6	0·22	16·7	83·3
St. George's .....	54	0·92	14·8	88·3
Cheetham .....	9	0·22	11·1	77·8
Crumpsall .....	4	0·43	50·0	50·0
Blackley .....	2	0·21	...	...
Harpurhey .....	7	0·35	14·3	85·6
Moston .....	4	0·24	...	50·0
Newton Heath .....	20	0·52	5·0	75·0
Bradford .....	38	1·53	13·2	76·6
Beswick .....	13	1·06	15·4	76·9
Clayton .....	8	0·69	25·0	12·5
Ardwick .....	27	0·62	14·8	81·5
Openshaw .....	14	0·49	7·1	78·6
Gorton (West) .....	34	1·09	17·7	70·6
Rusholme and Kirk...	7	0·27	...	85·6
Chorlton-on-Medlock..	23	0·41	26·1	69·6
Hulme .....	40	0·62	20·0	67·5
Moss Side .....	9	0·32	33·3	33·3
<b>City of Manchester.</b>	<b>345</b>	<b>0·59</b>	<b>15·9</b>	<b>72·7</b>

† Corrected; the fatal cases are those actually occurring amongst the cases notified.

5.—ENTERIC FEVER.—NUMBER OF ATTACKS, OF DEATHS, AND CASE FATALITY PER CENT. AT DIFFERENT AGES, FOR THE ELEVEN YEARS 1894-1904, AND FOR 1905.

AGES	1894-1904			1905		
	ATTACKS	DEATHS	CASE FATALITY PER CENT.	ATTACKS	DEATHS	CASE FATALITY PER CENT.
Under one year ...	5	2	40·0	3	...	...
1 to 2 years ...	22	6	27·3	9	...	...
2 to 3 „ ...	48	5	10·4	9	1	11·1
3 to 4 „ ...	75	10	13·3	6	...	...
4 to 5 „ ...	94	10	10·6	9	...	...
5 to 6 „ ...	116	14	12·1	6	...	...
6 to 7 „ ...	107	11	10·3	9	...	...
7 to 8 „ ...	109	9	8·3	5	...	...
8 to 9 „ ...	131	12	9·2	6	1	16·7
9 to 10 „ ...	108	9	8·3	6	1	16·7
10 to 15 „ ...	671	76	11·3	42	5	11·9
15 to 20 „ ...	780	151	19·4	47	9	19·2
20 to 25 „ ...	805	172	21·4	37	4	10·8
25 to 35 „ ...	997	221	22·2	102	23	22·6
35 to 45 „ ...	467	133	28·5	31	7	22·6
45 to 55 „ ...	204	65	31·9	13	2	15·4
55 to 65 „ ...	64	29	45·3	1	...	...
Over 65 „ ...	16	8	50·0	4	2	50·0
<b>All ages .....</b>	<b>4819</b>	<b>943</b>	<b>19·6</b>	<b>345</b>	<b>55</b>	<b>15·9</b>

6.--ENTERIC FEVER MORTALITY, 1905. RATE PER 1000 LIVING, COMPARED  
WITH MEAN OF FIVE YEARS.

	1900	1901	1902	1903	1904	Mean	1905
England and Wales .....	0·16	0·16	0·13	0·10	0·09	<b>0·13</b>	0·09
London.....	0·17	0·12	0·13	0·09	0·06	<b>0·11</b>	0·05
Dublin .....	0·38	0·32	0·33	0·24	0·19	<b>0·29</b>	0·16
<b>City of Manchester</b> .....	0·14	0·14	0·12	0·17	0·12	<b>0·14</b>	0·09†
Manchester Township .....	0·14	0·16	0·12	0·16	0·15	<b>0·15</b>	0·12
North Manchester .....	0·14	0·13	0·11	0·15	0·11	<b>0·13</b>	0·07
South Manchester .....	0·14	0·13	0·12	0·18	0·11	<b>0·14</b>	0·09†

† Exclusive of Moss Side and Withington.

In the Annual Report for 1904, from an elaborate analysis of the Inspectors' investigations on individual cases, supplemented by special inquiries made by Mr. Hewitt, and of the distribution of the cases in Sanitary Districts, I was able to arrive at these conclusions.

The predominant mode of spread of Enteric Fever in Manchester is what may be termed "direct infection," which is taken to include transmission from one individual to another in the same house or neighbourhood, it being shown that there are opportunities for the carriage of infection from one to the other.

Shellfish were, in that report, shown to exert an influence in the propagation of the disease, least during the summer months.

It was suggested that in the warm season flies are instrumental to a certain extent in transmitting infection, and some facts were given bearing on that view.

Water could be excluded as the vehicle of transmission, as could milk.

With respect to raw foods which could be regarded as possible vehicles of infection, viz., lettuce, watercress, and fruit, the facts collected scarcely permitted of a positive opinion.

There were no special facts pointing to fried-fish shops, although potatoes carelessly handled might be supposed capable of conveying the disease.

The distribution in districts pointed very strongly to local disseminations of the disease.

It ought to be possible to put these conclusions to the test of investigation, and I therefore requested Mr. Hewitt to visit a large proportion of the cases as they came up in 1905. It was, unfortunately, quite impossible for him to visit all the cases. Had this been done, the value of these inquiries would have been much increased. The result has been to confirm the immense part played by "direct infection," and to prove that the spot table in indicating local infections showed no more than what can be demonstrated otherwise.

But these inquiries have also served greatly to extend the importance of shellfish in the spread of Enteric Fever in Manchester.

The number of cases notified in 1905 was 340.

I propose to give a brief analysis of each case, so that the remarkable history of infection presented may be submitted to due criticism.

In the course of the necessary inquiries, a large number of overlooked cases and a few nests which ought not to have been overlooked came to the knowledge of the Public Health Office. Most of them were discovered by the Special Inquirer or by the Sanitary Inspectors. One was found by examination of the death registers and subsequent investigation.

As a result of Mr. Hewitt's inquiries, no fewer than 35 cases were found. In 29 of these, +<sup>ve</sup> reactions were obtained, and 23 were afterwards notified by medical practitioners. In 3 the result of the test was —<sup>ve</sup>, but the cases were almost certainly Enteric. In 3 it was not possible to obtain specimens.

As a result of the inquiries made by the Sanitary Inspectors other than Mr. Hewitt, 28 fresh cases were discovered, of which 23 gave a +<sup>ve</sup> reaction.

Two were dead and buried.

One gave a —<sup>ve</sup> reaction.

In two no sample could be obtained.

Fifteen of these were afterwards notified.

Thus, in all, 63 fresh cases were discovered by the Medical Officer of Health, aided by the Special Inquirer and the Sanitary Inspectors, but resting in part also on the bacteriological reports and on the assistance of the practitioners,—often, it is true, belated.

In addition, 21 tests were made of suspicious cases come across in Mr. Hewitt's work, all —<sup>ve</sup>. In 6 the request for a specimen was not complied with. In 2 I did not ask for one: once because of death, once because the original case was a very doubtful one.



There can be no doubt that a certain proportion of these cases was Enteric ; perhaps from  $\frac{1}{4}$  to  $\frac{1}{3}$ .

Thus in the above series : 1 is marked very suspicious ; 2 and 3 both suspicious ; 5 Dr. B. says she has had Enteric, but has not notified it ; 9 Dr. Forbes visited and found the spleen enlarged ; 22 Baby gave two —<sup>ve</sup> reactions ; father commenced later, and gave a +<sup>ve</sup> reaction.

In connection, also, with the District Inspectors' Reports, specimens were taken in suspicious contacts in 31 instances, to which the same remarks apply. All gave —<sup>ve</sup> reactions, and none were notified.

All these cases will be found in their proper place in the history of infection.

That it is so complete as it is, is due in no small degree to the deftness shown by Mr. Hewitt in seizing and following slight clues. At the same time, each investigation was carefully followed at the time, and the utmost use made of any facts recorded. Finally, when the inquiry forms came to be carefully reviewed, many cases fell into their place in series.

The results arrived at may be thus tabulated :—

#### ENTERIC FEVER, 1905.

	Cases traced to previous attacks	May have been due to shellfish	Not Traced	Not Enteric, or probably not Enteric	Total
First Quarter ..	48	22	21	13	104
Second Quarter ..	34	24	18	4	80
Third Quarter ..	17	12	17	9	55
Fourth Quarter ..	32	41	25	3	101
Total .. ..	131	99	81	29*	340

\* Of these, 13 certainly did not have Enteric, and 16 probably not.

A certain number of the above contracted the disease outside Manchester, and should, therefore, not be reckoned in discussing the proportion of cases traced. Of the above 131 traced to previous attacks, only 1 contracted the disease outside. Of those who may have been infected by shellfish, 4 contracted the disease outside the City—3 in the third quarter and 1 in the fourth.

Of those not traced, 14 contracted the disease outside: 5 in the second quarter, 7 in the third, and 2 in the fourth.

To calculate the proportion of cases traced we omit, therefore, the Non-Enteric cases and the 19 just mentioned, and the table becomes :—

ENTERIC FEVER, 1905, LESS CASES WHO CONTRACTED THE DISEASE OUTSIDE.

	Cases traced to previous attacks	Shellfish?	Not traced	Total
First Quarter ..	48	22	21	91
Second Quarter ..	34	24	13	71
Third Quarter ..	16	9	10	35
Fourth Quarter ..	32	40	23	95
Total .. ..	130	95	67	292
Percentage .. ..	44·5	32·5	22·9	..

It may be observed that 10 cases included under “not traced”—viz., 10, 33, 42, 50, 118, 138, 155, 186, 193, 197, and 251—show a history of infection which, in the last 9, may be regarded as not without value—though, for the purposes of the above table, they are placed among the untraced cases. They will be found under the history of infection.

It will be noted in the above table that the proportion of total cases traced to “direct infection” is highest in the first and second quarters, while that of untraced cases is lowest. The series of infections show no distinction between these two quarters. Infection from shellfish appears to be higher in the second than in the first quarter.

When we come to the third quarter we note a great change. It so happens that Enteric Fever was unusually low in this quarter in 1905. Still, it has been observed in previous years that the proportion of cases found in connection with the consumption of shellfish is diminished. The proportion found in 1905 is not lower than in the first quarter, but it is of a different kind ; also, the infection series do not enter nor start in this quarter. It appears as if there is an attempt at the elimination of Enteric Fever in the third quarter.

In the fourth quarter, as people gather together indoors, the series groups of cases recommence. With September comes a rush of mussels. It is but to be expected that the proportion found associated with mussels should increase. In the Annual Report for 1904, however, reasons were given for believing that the connection was largely one of cause and effect : reasons which are reproduced with increased force in 1905.

In the third quarter of 1905, the histories of direct infection and of association with shellfish are not so strong as in other quarters, and in reality it is probable that the proportion of untraced cases should be stated as higher. It is, in fact, higher than at other seasons. In all probability, this is to be associated with two things—one confusion with Summer Diarrhœa, the other transmission by flies.

Great stress was laid in the report for 1904 on the powerful effect exerted by overlooked cases on the spread of Enteric Fever. This is even more in evidence in 1905. The fault is divided between the parents and the medical attendant. When an illness occurs in a child attended with Diarrhœa, the tendency appears to be to put it down as an attack of Diarrhœa. *De minimis non curat lex*. Unfortunately, nature does not take the same view, and the result is a subsequent case or a series of subsequent cases.

Looking through the histories of infection, we find that overlooked cases giving rise to one or more subsequent cases number 36, divided as follows :—

Under 5 years, 14 ; over 5 years of age, 22.

The majority of these cases are children.

The same fatal tendency to overlook Enteric Fever in children is seen from the following table :—

	Cases under 5 years	5 —	10 —	15 +	Total
Enteric Fever, 1897–1904 .. .. .	159	387	452	2355	3353
Enteric Fever, 1905 .. .. .	27	29	38	217	311
Cases discovered by Mr. Hewitt .. ..	11	5	6	13	35
Cases discovered by other Inspectors ..	8	4	3	10	25

The overlooked cases discovered by inquiry are thus chiefly amongst children, and of children in those under five years of age.

More than this, a number are infants, apparently suffering from Diarrhœa.

The danger of this oversight, especially in the Diarrhœal season, is very evident.

In some instances the misdiagnoses have been very serious.

Last year I gave a dotted table showing for two years the distribution of Enteric Fever in districts for each month of the year. These picture tables and tables for previous years were considered to show that Enteric Fever is propagated in Manchester chiefly by local limited extensions, such as will be







abundantly illustrated by the direct inquiry about to be given. I give the corresponding picture table for 1905, omitting some cases in which the onset of the attack could not be accurately determined. It illustrates the contention already advanced in 1904, and also the facts as set forth, and it is not needful to insist further on this point. I would only call attention to West Gorton, in which an outbreak occurs in July, August, September. This is to be associated with a serious incidence of the disease in the neighbouring district of Gorton, to which some of the cases are definitely traced. The season at which infection occurs is coincident with the maximum prevalence of flies, and it is probable that they were partly instrumental in carrying the disease.

The statement of infections will be followed by a tabular exhibition of the facts relating to shellfish.

This in turn will be followed by an analysis of the remanent cases belonging to neither of the above classes.

These will be considered in relation to foods other than shellfish, and in reference to other sources of infection.

A classification of the cases has already been given on page 49.

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## HISTORY OF INFECTIONS IN 1905.

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### SERIES I.

Cases in 1904, 223, 311; in 1905, 20, 13, 7, 103.

The first history is one which concerns two families, which we shall call A and B, occurring in the St. George's Sanitary district.

1.—Mrs. B, daughter of Mrs. A., case 223, 1904. St. George's. Failed about September 1st, 1904, feeling ill and feverish. In the early part of August she had suffered from Influenza. On September 5th to 9th she had oysters at Blackpool, and on September 9th was taken much worse. Her illness was not notified till September 21st, and she was removed to hospital on September 23rd, being discharged on October 14th, 1904. Reaction +. She was removed from house (A), and returned to her mother's house (B).

2.—Her baby, E.B., case 20, 1905. St. George's. Took ill at house (B) about October 21st, 1904, had fever and convulsions, swollen stomach, dry lips till January 18th, and Diarrhoea for a few days. This case was notified on January 21st, 1905, having given a + reaction.



It will be manifest that the inmates at house (B) were exposed to infection in high degree. It is probable that the mother (Mrs. B.) carried the infection home from hospital in her system and infected her child, possibly by rubbing her gums.

3.—Mr. B., case 311, 1904. St. George's. Took ill about December 4th, and had a severe attack. He began to be ill at house (A). He had slept with his wife since her return home on November 21st, but was probably infected by the infant. His case was notified on December 8th. Serum reaction +.

4.—L.A. æt. 14, case 13, 1905. St. George's. Brother of Mrs. B. Was taken ill at house (B) about November 25th, 1904, with Influenza. He continued at work till November 28th, and then remained off work to December 13th. This illness was concealed by the relatives. The case was notified on January 18th, and a sample of blood gave a + reaction. This case was infected, no doubt, by the infant, whom he nursed.

5.—M.A. æt. 17, case 7, 1905. St. George's. Sister of Mrs. B. Was taken ill at house (B) about December 20th, 1904. The illness was notified on January 12th, and she was removed on January 13th to hospital. Her blood gave a + reaction. She is said not to have been in contact with the other cases.

This series illustrates the harm done by an overlooked attack in an infant, and it further appears that the inmates of house (B) did their best to conceal the attacks there, and possibly to some extent succeeded.

6.—Case 103, m. æt. 41. Clayton. Serum test +. Took ill March 27th. Case 223 (1904), the first in Series 1, was discharged from hospital on February 18th. On returning to work after discharge he had an illness, attended with Diarrhœa, probably a relapse. Case 103 was his foreman, and was probably infected by his means. (Return case—house C.)

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## SERIES 2.

Next, starting with case 3, 1905, we have the following series :—Cases 3, 9, 30, 36, 39, 63.

This series starts in 1904.

Case 3 was in the Sanitary District of Beswick (house A).

1.—The brother of case 3. Sanitary District of Bradford. Was removed to hospital on December 6th, and had been nursed by her at house (B).

2.—Case 3, 1905, f. æt. 48. Began to be ill on December 16th, 1904, house (A). Her illness was notified on January 6th, and she was removed to hospital on January 7th, 1905. This patient was a lodger. Serum reaction +<sup>ve</sup>.

3.—Case 9, 1905, f. æt. 24, house (C). Bradford. Began to be ill on January 4th, 1905, was delirious, and had Diarrhœa. Notification was received on January 13th, and patient was removed to hospital on January 14th. A sample of blood serum gave a + reaction. This patient visited her sister, tenant of house (A), and was much with case 3.

4.—Case 30, 1905, m. æt. 6, house (C), Bradford. Brother of case 9, began to be ill January 23rd, notified January 28th, removed January 30th. This was a slight case, but gave a + reaction. He was much with his sister during her illness.

5.—Case 36, 1905, f. æt. 22, house (A). Beswick. Was tenant, and nursed her lodger, case 3, 1905. She was taken ill about January 20th, 1905, and had Fever and Diarrhœa. Her illness was notified February 3rd, and she was removed to hospital on February 2nd. The Widal reaction was +.

6.—Case 39, 1905, m. æt. 4, house (A). Beswick. Began to be ill January 7th. Case not recognised. Sample of blood serum taken by request gave + reaction. Removed to hospital February 8th. This case was son of case 36, 1905, and was infected by case 3, 1905.

7.—Case 63, 1905, f. æt. 12, house (C). Bradford. Attended to cases 9 and 30, 1905, during their illness, was taken ill on February 20th. Notified on February 28th, and removed the same day. The blood serum gave a + reaction.

It will be noted that in all these cases the contact was intimate throughout.

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Case 5, 1905, m. æt. 26. District, Newton Heath, house (D). This is the terminal case of a long series in 1904 at another house (E), No. 341, 317, 318, 319, 331, 342, 1904. A milk jug was lent from this house to house (E), and served frequently to convey milk to both. The milk was kept in the sick room, and the jug was not sterilised after such use. Case 5 visited house (E) seven days before the commencement of his illness, but did not partake of food there. It is possible that disease may have been communicated by the milk jug. Serum reaction +.

Case 6, 1905, f. æt. 43, tenant of this house. Chorlton-on-Medlock. Serum reaction +. A female lodger, a waitress, now in Bolton, was ill here with Influenza from 14th to 28th December, 1904, and was still very unwell on December 28th. During this time patient slept in the same room with her lodger. Case 6 began to be ill on December 28th, 1904, and was notified on January 9th, 1905. There can be little doubt that the lodger had Enteric Fever.

Case 8, m. æt. 30. Hulme. His mother had an Influenza cold, beginning November 30th, and lasting a fortnight. She has these colds every winter. Severe headache, but no abdominal symptoms. Case 8 took ill on December 14th. This man habitually ate mussels, and, in this instance, I think mussels must be regarded as the more likely source of illness. Serum reaction +.

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SERIES 3.

Cases 10, 11, 12, 18, 19, 21, 53, 83, 158, 170.

All these cases were in the same street, and the houses were near to each other.

1.—Case 10, L.K. æt. 3. St. George's. Serum reaction +. Took ill about December 20th, 1904, Fever, Diarrhœa, Delirium. Notified January 17th. Slept in the same bed as her mother throughout. House (A). Illness not traced, but a playmate, house (B), took ill with an Influenza cold on December 11th, and was away from school for a week.

2.—Case 11, 1905, M.K. æt. 27. Mother and nurse of case 10, took ill January 4th. Had Bronchitis, was delirious and deaf, and had excessive diarrhœa. Notified January 17th. Serum reaction +.

3.—Case 12, 1905, N.K. m. æt. 29. Father of case 10, house (A). Took ill January 5th. Notified January 18th. Serum reaction +. He assisted to nurse case 10.

4.—Case 18, 1905, O.K. m. æt. 6. Brother of case 10. Last at school January 12th. Notified January 21st. Serum reaction +.

5.—Case 19, 1905, P.K. m. æt.  $1\frac{2}{2}$ . Brother of case 10. Began to be ill? Notified January 21st. Serum reaction +.

6.—Case 21, 1905, R.F. f. æt. 2, house (C). Took ill January 15th. Her mother assisted to nurse M.K., and this child accompanied her. Serum reaction +.

It is clear that house (A) was saturated with infection from case 10.

7.—Case 53, sister to case 11, 1905, f. æt. 29. Came to the house and helped to nurse. House (D). Serum test +. Took ill January 29th. Notified February 16th.

8.—F. æt. 5, daughter of case 53, 1905. Was a playmate and cousin of case 10, 1905. Took ill with an Influenza cold on December 11th, 1904, and was away from school for a week. She fell off her food and was feverish. Serum test taken in February? was —<sup>ve</sup>, house (D). Not notified.



9.—Case 83, 1905, m.  $1\frac{7}{12}$ . House (C). Serum test + on March 25th, though negative February 12th.

Onset of illness February 2nd. Notified March 27th. Not removed. Well-marked case. Diarrhœa, Fever, Swollen Abdomen.

Infected from sister, case 21, 1905, in whose bedroom she often was, and in whose bed she was placed.

10.—Case 158, m. æt. 27, house (E). Onset about March 13th. Removed to Crumpsall May 18th. Notified Enteric Fever May 22nd. Serum test +.

This man was brother-in-law to case 11, 1905, and also to case 53, 1905. He visited houses of case 53, and cases 21 and 83 during the infective periods of these cases.

11.—Case 170. At his visit to house (E) on May 26th, Mr. H. found a child, f. æt.  $1\frac{8}{12}$ , daughter of case 158, suffering from offensive Diarrhœa. A sample of blood was taken on June 7th, and gave a + reaction. Notified June 9th.

12.—F. æt. 3, daughter of case 10, house (A). Was very ill about April 23rd, but has now recovered. No test. Not notified.

13.—F. æt. 26. Mother of case 170, 1905. Sister to case 11, who nursed her and her children, has also passed through an illness, but appears to endeavour to conceal the facts. No serum test could be obtained.

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Case 15, f. æt. 12, Hulme. Took ill December 29th, severe Diarrhœa, serum reaction +. The mother here went out to work. The children were much neglected, and case 15 had to look after them. They would eat raw unwashed potatoes off the street. Case 15 was probably infected from an overlooked attack in a brother, æt. 6, who began to be ill December 11th. This child's attack was, doubtless, due to some filth consumed.

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#### SERIES 4.

Child, Cases 24, 34, 38, 43.

2.—Case 24, f. æt. 23, Bradford. Serum reaction +. Took ill about December 26th, 1904. She had severe Diarrhœa.

1.—Her child, m. æt. 3, began to be ill in the end of November, 1904, had fever, swollen abdomen, severe Diarrhœa, and was ill five weeks. The nature of his illness was not recognised. The serum reaction in February, 1905, was —. But no doubt he had Enteric Fever.

3.—Case 34, m. æt. 29. Husband of case 24. Began to be ill January 30th. No Diarrhœa. Serum reaction +. He nursed case 24.

4.—Case 38, f. æt. 22. Lodges here. Nursed case 34. Looks ill. Sample of blood requested February 2nd. Serum reaction +.

5.—Case 43, m. æt. 23. Husband of case 38. Notified February 11th. Stated by his wife to have had a slight illness in December, never off work. Serum reaction in February +.

Case 25, m. æt. 15. Openshaw. Began to be ill January 19th. Notified January 24th. Removed to hospital January 24th. Serum reaction +.

His brother, m. æt. 18, who slept in the same bed, took ill December 22nd, and has passed through an attack of Enteric. He is living outside Manchester.

Case 27, m. æt. 14. Central. Took ill January 12th. Notified January 26th. Had Fever and Diarrhœa. Died January 31st. Serum reaction +. History of consumption of mussels.

The following history, however, is notable:—

M. æt. 3, brother of above, was in Ancoats Hospital from October 9th to 30th, 1904, said to have suffered from Bronchitis and Fits.

M. æt. 17, another brother, began to be ill January 30th, 1905, with shivering, cough, and headache. He did not consult a doctor, and soon resumed work.

No test was taken in these cases.

I am disposed to think that these last two cases were not Enteric.

#### Case 32 and other illnesses.

1.—Case 32, m. æt. 16. Ancoats. Took ill January 18th, had Diarrhœa and delirium. Widal reaction +.

2.—M. æt. 19. Brother of case 32. Removed to Ancoats Hospital on January 19th suffering from Appendicitis. Serum reaction —<sup>e</sup>.

3.—M. æt. 17. another brother, who slept with case 32, was taken ill February 5th with pains in the abdomen, vomiting, headache, lassitude. Serum reaction —<sup>ve</sup>, but quantity of blood insufficient.

4.—M. æt.  $\frac{10}{12}$ . Had looseness of bowels second week in December, 1904. No sample taken.

Case 42, f. æt. 34. Ancoats. Took ill January 17th. Removed to Crumpsall January 24th. Notified February 8th. Serum reaction +.

This patient was a lodger, and the tenant, f. æt. 34, was ill since November 25th. On January 10th she had severe chill and fever. A sample of blood taken February 13th gave a — reaction.

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Case 44, f. æt. 3. St. George's. Taken ill, subsequently to the mother, case 33. Notified February 11th. Removed to Monsall February 13th. Serum reaction +. This child slept with her mother.

Case 33, f. æt. 27. Taken ill about January 1st. Removed to Crumpsall January 30th with her daughter, æt. 13, believed to be suffering from *a waste*. Notified February 2nd. Probably the daughter also had Enteric. The account of these cases is very imperfect.

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Case 50, m. æt. 9. Beswick. Took ill about February 1st. Notified February 16th. Removed to Monsall February 16th. Serum reaction +.

His sister, æt. 21, had an illness beginning September, 1904, was removed to Ancoats Hospital, and died on February 2nd. Death certified Bright's Disease. Stated not to have shown any signs of Enteric Fever.

Brother, æt. 14, had slight Rheumatism in the week ending January 7th.

Serum reactions were not obtained in the last two cases.

Case 57, m. æt. 16, Beswick. Took ill February 10th. Notified February 15th. Removed February 18th. Serum test +.

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Case 52, m. æt. 18. Openshaw. Took ill about February 4th. Notified February 16th. Removed February 17th. Serum test +. Next door a woman and two sons have recently suffered from Influenza. No dates given. These two families use the same midden privy. No serum test was taken in these cases.

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#### DOUBTFUL SERIES 5.

Cases 59, 64, etc.,

Case 59, m. æt. 3. Central. Took ill February 16th. Reported February 22nd. Removed February 22nd. Serum test +.

Case 64, f. æt. 4. Took ill February 27th. Reported March 1st. Removed March 2nd. Serum test +.



F. æt. 44. Has been ill with an Influenza-like cold all February. Serum test —.

F. æt. 17. Took ill February 25. M. æt. 14. Took ill February 25th. Illnesses of short duration. Serum test —.

The father, æt. 44, and the two children, 59 and 64, and these three alone partook of cooked mussels. The father had Enteric Fever 36 years ago.

It is very difficult under these circumstances to say that the two attacks in the children were not due to the consumption of mussels.

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#### DOUBTFUL SERIES 6.

Cases 56, 61, etc.

In this series, curiously, precisely the same difficulty arises as in Series 5. as regards the consumption of mussels.

Cases 61 and 56 had mussels together and both developed Enteric Fever at a period compatible with their having been infected by the mussels.

The infection series is as follows :—

1.—A child, m. æt. 11, had an illness, presenting features of Enteric, commencing about January 20th, 1905. District, Bradford. Serum test not taken.

2.—Case 56, f. æt. 34. Mother of above. Took ill with Enteric about February 3rd. Notified February 18th. Removed February 18th. Serum test +.

3.—Case 61, m. æt. 32. Off work from February 1st to February 8th. Serum test taken on February 27th was +.

4.—M. æt. 10 months. Slight illness with loose bowels end of February. Here again, in view of the fact that no sample was taken from the two children, it is not possible to decide between direct infection and the consumption of mussels.

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#### SERIES 7.

Cases 67, 75, 77, 86, 102, 128, 139, 145, and others.

1.—A.R. (Case 86, 1905), f. æt. 10. Bradford. Serum test +. Took ill about January 26th. Notified March 28th. Well-marked case with sores on the lips and excessive Diarrhœa. Serum test taken on April 10th as the result of the notification of the next case. House (A).

2.—B.R. (Case 77, 1905), f. æt. 7. Onset about February 5th. Notification March 22nd. Well-marked case. Serum test +. Blood taken by Dr. Forbes.

3.—C.R. f. æt. 9. Onset about February 5th. Severe case. Swollen abdomen, Diarrhœa. Death. Not notified.

4.—D.R. m. æt. 6. Onset February 6th. Diarrhœa. Unconsciousness. Death. Not notified.

5.—E.R. m. æt. 2. Had an attack of Diarrhœa on March 12th.

Dr. Forbes notes that the four oldest children were all nursed in one bed. Probably the whole family, excepting an infant, have had Enteric Fever.

Difficulties were raised by the Medical Attendant as to the taking of samples by Dr. Forbes in these cases. A sample was, however, taken from the fifth case above on May 3rd, and gave a reaction + incomplete.

Samples were also taken from the mother and infant on May 3rd.

6.—A. S. f. æt. 2. Case 67, 1905. Clayton. Took ill about February 26th. Notified March 8th. Serum test +. House (B). Inasmuch as this child had already Diarrhœa and great pain in the abdomen on February 26th, the date of onset should, no doubt, be put further back.

This child was taken by her mother to house (A) during the month of February and partook of food and drink there ; also played with the infected children.

7.—B.S. m. æt. 11. Case 128, 1905. Ill in bed 3 days. Onset end of February. Serum reaction + incomplete. Notified April 28th. (Overlooked case).

8.—C.S. m. æt. 14. Case 139, 1905. Ill a few days. Overlooked case. Onset end of February. Serum reaction + incomplete. Notified May 1st.

9.—D.S. f. æt. 18. Case 75, 1905. Took ill March 12th, 1905. Notified March 20th. Serum test +.

10.—E.S. m. æt. 17. Case 102, 1905. Took ill March 13th, 1905. Notified March 31st. Case not well marked clinically. Serum test +.

Attention was called to house (A) on examination of the death cards in the Public Health Office.

Case 68, 1905, m. æt. 15. Hulme. Took ill February 27th. Test +.

Brother, m. æt. 16. Began to be ill February 28th. The illnesses were similar. Both had steamed mussels at the same time. No test taken.

Another brother, æt. 2. Began to be ill on March 15th. No serum test. No doubt all of them had Enteric Fever.

Case 71, f. æt. 27. St. George's. Blood test +. Took ill March 3rd. Mussels.

Husband subsequently was taken ill on March 22nd with an Influenza cold. No test made.

Case 72, m. æt. 42. Hulme. Blood test +. Took ill February 4th. Removed to Withington February 28th. Notified March 13th.

F. æt. 3. Had loose bowels one day, March 14th. Serum test —.

M. æt. 2. Had Diarrhœa for two or three days, beginning March 2nd. Serum test —.

Baby, æt. 3 weeks, died of convulsions on February 27th.

These three subsequent cases may have been Enteric.

Case 73, m. æt. 35. Moston. Serum test +. Took ill March 2nd. Mussels

M. æt. 3. On March 15th was sick and had loose motions. Illness only transient. No test.

#### SERIES 8.

Cases 58, 74, 78.

Case 58, 1905, f. æt. 25. St. George's. Took ill February 5th. Notified February 20th. Removed February 22nd. Serum test +. Mussels case.

Case 74, m. æt. 45. Brother of case 58. Took ill March 11th. Serum test +. He slept in the same room with his sister.

Case 78, f. æt. 3. Niece of cases 58 and 74. Was much with case 74. Took ill March 15th, 1905.

This case was, no doubt, infected from case 58. Serum test +.

#### SERIES 9.

Cases 76, 91, 92, 93, 109, 110, all in one house.

1.—M. æt. 9. Not notified. Hulme. No test taken. Took ill February 14th, 1905. This boy, from the account of his illness, plainly had Enteric Fever. He was at home from February 18th to March 10th. He had only slight Diarrhœa.



2.—Case 76, 1905, m. æt. 37. Took ill March 7th. Notified March 20th. Removed March 21st. Died. Serum test +.

3.—Case 91, 1905, m. æt. 20. Took ill March 16th. Notified March 28th. Removed April 6th. Serum test +.

4.—Case 92, 1905, m. æt. 23. Took ill March 18th. Serum test +.

5.—Case 93, 1905, f. æt. 11. Took ill March 21st. Serum test +.

6.—Case 109, 1905, m. æt. 9. Took ill April 4th. Notified April 6th. Serum test +. Not removed.

7.—Case 110, 1905, m. æt. 6. Took ill April 3rd. Notified April 8th. Not removed. Serum test +.

Cases 91 and 92 slept in the same room with case 76. These people were very poor, and the household was careless.

Cases 1, 3, 4, and 5 were discovered on visiting case 76. The attacks of the last three were slight.

Case 79, 1905 (St. George's), m. æt. 18. Took ill March 10th. Notified March 24th. Removed March 25th. Serum test +. Was in the habit of visiting a beerhouse at which the landlord passed through an illness from which he recovered about March 1st. He was relaxed, had pains in his stomach, vomited, could not eat solid food, could not sleep for having to get up to use the utensil, was very thirsty, had coated tongue. He was laid up about 11 days.

No person employed in the beerhouse, however, had Enteric Fever.

A specimen of blood was asked from this publican, but none appears to have been taken.

When asked to what he ascribed his illness this man said, "Oh, draughts, or some cockles which I ate." These he had about a fortnight before the beginning of his illness.

Case 81, 1905, f. æt. 12½. Moss Side. Took ill March 10th, 1905. Notified March 25th. Removed March 28th. Serum test +.

F. æt. 19. Sister of above. Had an illness beginning about 3 weeks before her sister's. Her symptoms, she states, were these:—Severe headache, felt languid, could not stand or sit at her work, was shivery, had slight cough, could not take her food. She had severe pain in the stomach and abdomen. Her tongue became badly coated, her lips were parched and dry. She felt

sick, and could not sleep during the first week. During the second week she was feverish, and had slight Diarrhœa. She was off work for a month. Her hair is now (June 5th) coming off. The serum test taken June 7th was —<sup>ve</sup>.

There can be little or no doubt that this girl passed through an attack of Enteric. The case was not notified. She ate much shellfish, and from two to three weeks before the commencement of her illness she had raw oysters and steamed mussels from a man with a handcart in the street.

Case 197 is probably in association with the above two. The backs of the houses in which 81 and 197 lived are opposite each other, and the number of flies found at the latter was tremendous.

Case 197 took ill August 4th. Serum reaction +.

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#### SERIES 10.

Cases 88, 89, 90, 114.

These cases were very carefully enquired into by Mr. H., but the sources of information were most inadequate.

1.—F. æt. 2½. Case 114, 1905. Ardwick. Took ill about February 15th. Fever, vomiting, severe Diarrhœa. Ill up to removal of her mother on March 24th. Serum test on 12th April + incomplete. This child had, no doubt, Enteric, but the source of her illness could not be ascertained. Nature of illness not recognised.

2.—M. æt. 8. Brother of above, case 88, 1905. Took ill about February 28th. Notified March 28th. Removed to Withington Union Hospital March 24th. Serum test +. This child was very ill, and had Diarrhœa.

3.—F. æt. 26. Case 89, 1905. Mother of above children. Took ill about March 7th. Removed to Withington Hospital March 24th. Notified March 28th. Died. No test.

4.—F. æt. 14. Case 90, 1905. Nursed case 89, 1905. Took ill about March 21st. Removed to Withington March 24th. Notified March 28th. Serum test +.

These four persons all occupied one bed. The drains were stopped up since Christmas, 1904, and the pipes were leaking freely.

Case 89, and also cases 88 and No. 1 of this series, visited another house, in which the brother-in-law of case 89 died of Pneumonia about February 5th, 1905. A week earlier a niece died at the same house of convulsions.

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Case 96, 1905, m. æt. 13. Newton. Took ill March 20th. Notified March 29th. Removed March 30th. Serum test +.

His mother, f. æt. 50, had an illness attended with vomiting and purging, which began on February 25th, 1905.

Blood test requested, apparently not made.

Aunt who nursed case 96 is now ill, has headache, slight cold, and cannot take her food. (April 12th.)

#### Cases 97, 196.

Case 97, 1905, m. æt. 13. Ardwick. Took ill March 13th. Notified March 29th. Removed March 31st. Serum test +.

Mother began to be ill with an attack of Influenza about February 28th, 1905, ill until March 6th. Serum test after April 14th — <sup>ve</sup>.

Case 196, onset 28th July, serum test + <sup>ve</sup>. Case 97 was discharged from Monsall Hospital on May 9th, and afterwards slept in the same room with case 196, f. æt. 10.

No doubt case 196 was infected in some way from case 97, but the mode is not at all clear. A sofa bed was left at home, when disinfection was carried out on which case 97 had been nursed during part of his illness. Possibly infective matter was retained in this.

Case 100, m. æt. 19. West Gorton. Took ill March 25th, 1905. Removed to Withington Hospital March 29th. Notified March 30th. Died.

F. æt.  $2\frac{1}{2}$ . Began with Diphtheria February 25th, 1905. Died in Monsall March 5th, 1905. Face and neck much swollen, had Diarrhœa, swab — <sup>ve</sup>.

F. æt. 9. Began to be ill April 3rd. Headache, pains in stomach, thirst, shivering, cough, lips parched. Dr. Forbes visited on April 8th and found the spleen enlarged. Serum test — <sup>ve</sup>.

*(End of the first quarter.)*

#### SERIES II.

Cases 107, 108, &c., all in one house.

1.—The first in this series was a child, f. æt.  $2\frac{1}{2}$  years. West Gorton. Took ill about February 14th with severe headache, general illness, and anorexia. Doctor called in about the end of February. Child removed to Monsall on March 3rd. Diphtheria bacilli found at the hospital.



2.—Case 107, 1905, f. æt. 18. West Gorton. Took ill March 6th. Notified April 4th. Removed April 5th. Serum reaction +. This patient was out of work, and spent her spare time with a friend at the house of the above case.

3.—A sister of case 107, f. æt. 13, took ill about March 13th with headache, pains in the abdomen, shivering, and anorexia. For about a week she suffered from Diarrhœa. She did not visit the house above mentioned. No serum test.

4.—Case 108, 1905, m. æt. 15, took ill about March 26th. Serum test +. He lay on the same bed with case 107 while she was ill.

Assuming that the third case in the above series suffered from a slight attack of Enteric Fever, and that the first had Diphtheria, it does not seem likely that the first case had also Enteric Fever, though this is not certain. It is more likely that there was a slight overlooked attack in the household.

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#### SERIES 12.

Cases 115, 124, 125, 135, 136, 137, 148, 149.

This series was investigated by Inspector Priestley.

1.—A.R. f. æt. 12, case 247, 1904. St. George's. Took ill September 26th. Removed to Monsall October 5th. Serum reaction October 2nd, +. House (A). This child had ice cream on September 9th. The district was an infected one, and the household was much pestered by flies.

2.—B.R. case 307, 1904, f. æt. 37, mother of case 247. Took ill November 1st. Serum test December 7th +. Removed to Monsall December 7th.

3.—A.S. f. æt. 14, case 135, 1905. St. George's. House (B). Took ill December 14th, 1904. Case not diagnosed. Serum test + incomplete. This patient had well-marked illness, but no Diarrhœa. She did washing and cleaning for case 307, 1904. Notified May 1st.

4.—B.S. case 24, f. æt. 53, house (B). Took ill beginning of February, 1905. Serum test April 21st +. Notified April 27th. This patient had a well-marked attack with Diarrhœa. Food left by case 135 was partaken of by case 124.

5.—C.S. m. æt. 18, case 115, son of case 124. Took ill March 22nd. Removed April 20th. Serum test April 17th +. This patient had Diarrhœa. Slept in the same room as his mother, and partook of food left by her.

6.—D.S. f. æt. 19. Took ill April 19th. Removed April 29th. Serum test +. No Diarrhœa. Nursed mother and brother. Washed infected clothing.—Partook of food left by the patients.

7.—F. æt. 14, friend of case 124, house (C). Took ill January 3rd. Serum test? But, though this patient suffered also from Pneumonia and Pleurisy, there is practically no doubt that she had Enteric Fever. Visited case 124 several times during her illness.

8.—G.K. m. æt. 2, house (B). Specimen taken May 2nd +. *No history of illness.* Removed to Monsall. Notified May 3rd.

9.—O.P. m. æt.  $1\frac{2}{12}$ , house (B). Specimen taken May 2nd +. Removed to Monsall. Notified May 3rd.

10.—T.P. f. æt. 23, mother of last case. Specimen May 10th + incomplete. *No history of illness.* House (B). Notified May 11th.

11.—E.S. f. æt. 13. Test May 10th +. *No history of illness.* Notified May 11th. House (B).

Specimens were taken from the last four individuals on account of previous cases having been overlooked.

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Case 118, f. æt. 25. Hulme. Took ill April 8th. Notified April 20th. Serum reaction +.

M. æt. 32, husband of above Took ill about March 17th with severe headache and chill, and was off work a few days. No test.

F. æt. 3, daughter of above. Took ill about March 31st. Had an influenza cold, was costive, and then had Diarrhœa, and fell off her food for a week. Now in Sale.

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Case 119, 1905, f. æt. 29. Cheetham.

1.—Her daughter, æt.  $2\frac{1}{12}$ , had been in Monsall suffering from Diphtheria and returned home March 3rd, 1905.

About March 24th this child commenced with a fever attended with Diarrhœa, which was, no doubt, Enteric. The parents would not consent to a serum test being made.

2.—Case 119, æt. 29, mother of above. Was taken ill about April 8th with well-marked Enteric Fever.

Serum reaction +. Removed to Monsall April 22nd. Case 1 was probably contracted in the Diphtheria Ward. Several cases of Enteric Fever occurred at this time which were traced to an obscure overlooked attack in a patient sent in suffering from Diphtheria.

Case 152, 1905, m. æt. 9. Hulme. Serum test +. Took ill May 2nd, 1905. The mother of this child waited on case 140, 1905, at another house, f. æt. 19. On April 27th she took case 152 into the sick room. Case 140 had a motion which was very offensive, and she let the child look at it.

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Case 155, 1905, m. æt. 27. Bradford. Serum test +. Took ill May 6th. Notified May 18th. Removed May 19th.

His son, æt. 6, commenced with an attack of Pneumonia on February 15th. The teacher sent him home because he looked flushed. At that time he complained of pain in his stomach. This child was away from school from February 15th to March 13th. This may have been an attack of Enteric Fever. A blood test was asked for, but apparently not made.

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### SERIES 13.

#### Cases 156, &c.

1.—F. æt. 36, case 200, 1904. Harpurhey. Began to be ill with Enteric on August 13th, 1904. Notified August 31st. Serum test +. House (A).

2.—M. æt. 39, discovered in March, 1905. Began to be ill with Enteric on August 3rd, 1904. Not notified. House (A).

3.—Case 156, 1905, m. æt. 17. Began to be ill May 1st, 1905. Well-marked Enteric. Notified May 19th. Removed May 20th. House (A).

The mother states that there were two beds in the room occupied by case 1 before removal, only one of which was removed for disinfection. The other has since been occupied for 3 months by case 156. (This statement may be doubted.)

4.—The brother of case 156, m. æt. 3, had an illness lasting 5 weeks in December, 1904, and January, 1905. Again, in April, he had an attack of Bronchitis lasting 10 days, during which he was feverish and refused food. At this time he had slight Diarrhœa. House (A).

The father refuses, violently, to allow the Medical Attendant to take samples of blood from the children for examination. I strongly suspect that there have been other illnesses in this house. It may be, however, that the illness of case 156 was contracted at a public-house, and not through the above course at all (see next case).

Case 159, m. æt. 27. St. George's. Took ill about May 9th. Serum test +. House (B).

Cases 156 and 159 both frequent a billiard-room in a public-house.



The landlady of this public house began to be ill early in May.

The landlord began to be ill on May 28th.

No test was taken in these two cases, though asked for. The symptoms appear to me to indicate Enteric Fever. It is thus possible that cases 156, 159, and the illness of the landlady may be due to some overlooked case at the public-house. On the other hand, 156 might have been infected at home and 159 by mussels.

Case 160, m. æt. 12. St. George's. Took ill about May 11th. Notified May 25th. Serum test +.

Previous case 144, m. æt. 22, at the same house. Took ill about April 12th. Notified May 5th. Due apparently to consumption of mussels. There was, apparently, no contact between these cases.

#### SERIES 14.

Cases 161, 167, 175, 176.

1.—A fellow workman of the next case began to be ill in the beginning of March, 1905, and was laid up for two months. He had fever and Diarrhœa. House (A). Apparently no test was made, though asked for.

2.—Case 175, 1905, m. æt. 42. Chorlton-on-Medlock. Took ill on March 15th. Well-marked attack. Serum reaction +. House (B).

3.—Case 161, f. æt. 44, wife of case 175. Took ill May 15th. Serum test +. Notified May 27th. Removed May 29th.

4.—Case 167, f. æt. 67. Took ill May 13th. Serum test +. House (C). This case nursed case 175, 1905.

5.—Case 176, m. æt. 3 months, child of cases 175 and 161. Took ill about March 29th. Serum test +. House (B).

All these cases except case 161 were discovered by Mr. H.

#### SERIES 15.

Cases 164, 165, 166, 180, &c.

Case 1, a man, æt. ? Openshaw. Took ill end of October, 1904. Subsequent to the investigation of these cases, the medical attendant on this man has stated that he has no doubt that this was a case of Enteric Fever. He could not get a serum test. House (A). The son of this man was a companion of case 2 in this series.

Case 2, m. æt. 17. Openshaw. Onset December 27th, 1904. Severe attack of Enteric Fever. Not recognised. Serum test in July, 1905, —<sup>ve</sup>.

This man's illness lasted till March 17th, 1905. House (B).

Case 3. Case 164, 1905, f. æt. 30. Openshaw. Nursed the last patient. Took ill April 1st, 1905. Notified June 2nd. Removed to Hospital June 3rd. Serum test +. House (C).

Case 4, f. æt. 6, case 165, 1905, daughter of above. Taken ill May 7th. Serum test + incomplete. Notified May 31st. House (C).

Case 5, f. æt. 23, case 166, 1905, sister of case 3. Took ill May 19th. Serum test +. Nursed cases 3 and 4. House (C).

Case 6, f. æt. 10 months, daughter of case 166. Took ill June 2nd. Serum test June 5th was —<sup>ve</sup>. But the child, no doubt, had Enteric. House (C).

Case 7, f. æt. 3, case 180, 1905, daughter of case 3. Took ill about June 3rd, 1905. Notified June 19th. Removed June 20th. Serum test +. House (C).

Case 98, 1905, m. æt. 19. Hulme. Took ill March 14th. Notified March 29th. Apparently contracted from eating mussels. This case was nursed at home. Serum test +.

Case 169, 1905, m. æt. 5. Took ill May 22nd. Slept in the same bedroom with case 98. Serum test —<sup>ve</sup> June 7th, + June 30th.

Case 177, f. æt. 27. Cheetham. Took ill June 13th. Serum test +. This patient had been in Monsall in the Diphtheria Ward, and was discharged on May 30th. Possibly contracted in the hospital.

Case 182, f. æt. 70. Newton. Took ill June 6th. Serum test +. Nursed her daughter, case 151, whose attack was possibly due to watercress, from May 1st to May 12th. On May 12th she kissed her daughter on the lips.

*(End of the first half-year.)*

### HISTORY OF INFECTION—THIRD QUARTER.

The history of infection in the third quarter is very different from that obtaining in the first two quarters. With one exception, there are no series of illnesses. As regards shellfish, also, we do not obtain a clear record against mussels as we do in the first two quarters. It will be noted that the shellfish are in 5 instances mussels, in 3 oysters, in 3 whelks, and in 1 cockles. In three of these the shellfish were consumed away from Manchester.

The total number of cases in this quarter was 55. Of these, 7 were probably or certainly not Enteric Fever, and 9 were contracted outside Manchester, leaving 39 to account for. In none of those accepted as possibly associated with the consumption of shellfish was a history of contact with a previous case ascertained. They number 10, in addition to two, in which the shellfish were consumed in Ireland. Subtracting these, we have 27 cases left to be accounted for.

The cases in this quarter were not so fully investigated as in the first two, but, apart from this, there is an indefiniteness about the histories of direct infection which will be apparent in the following summary.

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Case 186, f. æt. 29. Moss Side. Began to be ill on June 21st. Notified July 15th. Serum reaction +.

Visited Lytham on June 3rd, Lymm on June 14th, at which place she used an offensive privy midden.

Her mother purchased various articles of attire for case 186 from a shop in this district, at which there were two shopmen. One of these was removed to Ladywell Sanatorium on May 29, and died there of Enteric Fever. His assistant, a youth, was taken ill on June 4th, but continued to serve in the shop till June 30th. He had pain in the abdomen, diarrhœa commencing June 4th, which lasted 5 days; anorexia, and rose spots on the abdomen. The serum reaction on June 9th was negative, and no subsequent specimen appears to have been taken.

The wife of the shopkeeper and two children had suspicious illnesses, but specimens gave a —<sup>ve</sup> result.

It is probable that the assistant, at all events, had Enteric Fever.

It is interesting to note that the shopkeeper who died in Ladywell was probably infected by mussels.

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Case 193, f. æt. 50. West Gorton. Took ill July 25th. Notified August 5th. Serum reaction +.

Her granddaughter, æt. 3, had Brain Fever and Diarrhœa at another house, and was nursed by patient. Her illness commenced May 6th, and was marked by Diarrhœa, delirium, swollen abdomen. She died on May 14th.



It is probable that this was an attack of Enteric Fever, but the intermediate steps by which the disease might have been conveyed are not made out. Possibly it was due to the child's clothing, as after her death her parents resided with the grandmother.

There was a tremendous number of flies in the house of case 193.

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SERIES 16.

Cases 194, 201, 202, 207, 210, 218.

All these cases occurred in 4 houses, in 3 different streets, but within a short distance of each other.

3.—201, m. æt. 15. West Gorton. Took ill August 11th. Notified August 25th. Serum test +. Flies at this house numerous. House (A).

1.—m. æt. 14. House (A). Overlooked illness, began about July 12th. Anorexia, abdominal pain, fever. Illness lasted a fortnight. No test made.

2.—194, f. æt. 7. House (B). Began to be ill August 2nd. Notified August 8th. Serum test +. Carried by flies?

4.—f. æt. 6. Began from August 13th to 20th. House (A). Anorexia, languor, fever, diarrhœa. No test made.

5.—202, f. æt. 5. House (C). This house and house (A) are separated by a passage, and the children are playmates. Took ill August 14th. Serum test +.

This is a greengrocer's shop.

6.—207, m. æt.  $1\frac{8}{12}$  years. House (C). Took ill August 26th. Died. Serum reaction —<sup>ve</sup>. No doubt Enteric.

7.—210, f. æt. 12. House (D). Took ill August 27th. Acted as nurse at house (C).

8.—218, m. æt. 31. House (C). Father of 5 and 6. Took ill about August 24th. Serum reaction + slow and incomplete. Notified September 5th.

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212, f. æt. 23. Bradford. Took ill August 10th. Notified September 2nd. Test +.

Her sister, æt. 30, had a similar illness prior to her attack, and the two were much together. This attack was not recognised. No test.

Patient's sweetheart has also passed through an illness. He lives at Gorton,

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SERIES 17.

Cases 213, 219, 230.

2.—213, f. æt. 27, Ardwick. Took ill August 21st. Notified September 2nd. Test +.

1.—F. æt. 3. Began to be ill August 1st, was ill 3 weeks, and had excessive diarrhœa, vomiting, and swollen abdomen. Test September 29th —<sup>ve</sup>.

3.—219, m. æt.  $1\frac{1}{2}$ . Onset August 27th. Vomiting, Diarrhœa, high temperature, etc. Test September 7th +.

4.—230, m. æt. 7. Took ill September 16. Notified September 23rd. Tests —<sup>ve</sup>, + incomplete, and +.

The number of flies is tremendous.

226, m. æt. 31. West Gorton. Took ill September 11th. Notified September 14th. Test +. Contracted from his wife, f. æt. 31, who took ill August 18th. Was notified August 30th.

No information could be obtained as to the source of her illness.

SERIES 18 (AT ONE HOUSE).

Cases 235, 236, 237, 243.

1.—M. æt. 10, case 236. Bradford. Took ill September 10th. Notified September 28th. Serum test +. 2 to 3 weeks before he took ill was playing in a back passage, and went into a privy midden after his ball. Alterations were going on in these privy middens.

2.—f. æt. 3, case 235. Took ill September 18th. Notified September 28th. Serum test +.

3.—M. æt. 5, case 243. Onset September 20th. Notified October 3rd. Serum test +

4.—M. æt. 7, case 237. Onset September 26th. October 2nd removed. Serum test +

These cases may be assumed to have been due to a previous undiscovered attack.

SERIES 208, 262, 288. (*See 4th Quarter.*)

231, m. æt. 24. Ancoats. Onset about September 14th. Notified September 25th. Test +. Patient was admitted into Ancoats Hospital on August 25th suffering from suicidal cut throat, and probably contracted the disease in hospital.

It might be supposed from the above that these cases had not been investigated so fully as previous cases, and to some extent that is true. From the beginning of August onwards there is always some one away from the office, and the routine work is too great to allow of the time being given necessary for these inquiries. Nevertheless, a considerable amount of inquiry was instituted.

A small outbreak occurred in the second half-year in West Gorton, but the number was small compared with that occurring in the adjoining district of Gorton, of which we had little or no knowledge. It may be observed, however, that of the 10 ascribed in the third quarter to infection outside Manchester, 5 were infected in Gorton.

Of the 16 cases which are ascribed with probability to previous known attacks, 12 in number, in 5 households, 3 are ascribed to previous attacks in children, 2 of which would be regarded as ordinary Summer Diarrhoea.

In the group 194, 201, etc., we find that flies were very numerous.

This was also the case in 193.

In the series 213, 219, and 230, also, the number of flies was tremendous.

It is reasonable to suppose that the initial Diarrhoea in all these cases was probably imported by flies.

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#### HISTORY OF DIRECT INFECTION IN THE FOURTH QUARTER OF 1905

243. Belongs to Series 18.

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#### SERIES 19.

Group 244, 260, 279.

2.—Case 244, f. 27. Harpurhey. Onset about September 27. Notified October 5th. Test +.

This case was infected through an unrecognised attack in her child.

1.—Case 260, f. æt. 3. Onset beginning of September. Notified October 17th. Died October 4th. No test.

This child passed through an illness, with copious Diarrhoea, discovered through visit from P. H. O.

3.—Case 279, m. 8 months. Onset October 20th. Notified October 30th. Test +.

244 and 279 were removed to Monsall on October 30th

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## SERIES 20.

## Group 245, 250, 261.

1.—Case 261, m. æt. 2. Beswick. Onset September 18th. Notified October 17th. Test +.

This case was overlooked in the first instance, though he had Diarrhœa for 5 weeks, and was recognised through the visit from the P. H. O. Test +.

This looks like a return case.

A case of Enteric Fever returned from Ancoats Hospital (198 +) on September 5th to next door, came home very weak, and had much to do with case 261.

This patient was taken ill July 23rd.

2.—Case 250, m. æt. 22. Onset September 27th. Notified October 10th. Test +. Generally sleeps on the hearthrug on Saturday nights, and case 261 was nursed in the living room. Discovered through visit from P. H. O.

3.—Case 245, m. æt. 4. Onset September 28th. Notified October 6th. Test +. Infected from his brother

The father, who lifts night pails, often nursed case 261. He states that his clothes often get splashed with urine and excreta, and often smell.

The origin of case 261 is further complicated by the circumstance that he is believed to have eaten trash off the street.

The most probable source is the discharged case of Enteric next door. This Case (viz., 180) may, however, have been infected, in the first instance, from the father's clothes.

## SERIES 21.

## Group 246, 274.

1.—246, m. æt. 22. Openshaw. Onset September 19th. Notified October 6th. Test +. Removed to Withington Union Hospital. Probably infected by mussels. Drank heavily of beer.

2.—274, f. æt. 25. Onset November 1st, wife of above. Test + doubtful.

3.—Not notified, m. æt. 3. Illness lasted 2 weeks, Diarrhœa October 12th and 13th. Test —<sup>ve</sup>.

4.—Not notified, f. æt.  $\frac{1}{2}$ . Ill 2 weeks, Diarrhœa. Test —<sup>ve</sup>.

5.—Brother of 246. Had an illness beginning October 7th, which lasted about 10 days. Test —<sup>ve</sup>.

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Case 248, f. æt. 20. St. George's. Onset October 6th. Notified October 9th. Test +. Admitted into the Royal Infirmary on September 8th with Gastric Ulcer, and apparently contracted Enteric Fever there. Source not discovered.

It is notable, however, as showing how infection may occur from an illness in such an institution, that she was next bed to a child who was taken ill with Enteric Fever on September 27th, admitted to the Infirmary October 4th, and removed to Monsall October 12th.

It is quite possible that some other slight attack in the Infirmary led to the infection of case 248.

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#### Cases 249, 264.

Case 249, f. æt. 5. West Gorton, Onset September 25th. Notified October 9th. Test +. This child ate all sorts of trash from the streets and from Gorton Wakes. She also passed the day at a house close to that lived in by a child who was removed to hospital on August 8th suffering with Enteric. The house in which case 249 then lived was beset by a tremendous number of flies in an infected district. The privy midden was wet. She had fruit from a shop which had recently been invaded by Enteric Fever.

Of these various sources of infection, flies may be regarded as, perhaps, the most probable. In support of this, it may be mentioned that a playmate was removed to Monsall on August 5th suffering from Enteric Fever, who spent the day-time in the house next to that in which this child was during the day.

Case 264, f. æt. 32, mother of above, slept with her, and was attacked by Enteric Fever on October 13th, 1905. Test +.

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#### Cases 251 and 277.

Case 251, f. æt. 8. St. George's Onset September 27th. Notified October 12th. Serum test +. Believing this to be a case of Diarrhœa of a serious character, the Medical Attendant had her removed to the Royal Infirmary on October 4th, from which institution the case was notified on October 12th.

The Inspector on visiting at the house was informed that some weeks prior to the child taking ill the drinking water had been dirty. He thereupon visited 12 adjoining houses. In three besides the one under examination he found that Diarrhœa had been present: in children in all cases, in adults in one.

At one of these the medical practitioner, at my request, took two samples of blood-serum, one from a baby and one from the father, who was ill at the time. The former gave a —<sup>ve</sup>, the latter a + reaction.

This is Case 277:

It is probable that both father and child had Enteric Fever, and it is very likely that in both the other houses the same was the case.

Inquiry was made in the Water Department as to any defect having occurred in the pipe supplying these houses, but none had been reported. It was thought to be quite likely, however, that such a defect had existed, and had been repaired without reference to the office. I do not think these cases were due to water, as the primary illnesses were in young children. It is more likely that the disease was transmitted by flies from previous overlooked attacks of so-called Diarrhœa.

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SERIES 22.

Groups 208, 262, 288.

262, f. æt. 24. Ancoats. Onset about September 8th. Notified October 18th. Serum test +.

This illness was contracted from patient's husband, case 208, removed to Crumpsall on August 21st.

288, f. æt. 6. Began to be ill on September 20th, feverish, removed to Crumpsall with mother on October 6th. Notified November 6th. Serum test +.

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267, m. æt. 46. Newton. Onset October 1st. Notified October 19th. Test +. At this house, an infant, 13 months old, had been ailing since June, during which time it wasted, and had loose motions. This infant became worse, however, apparently had fever and increased Diarrhœa, and died on October 17th. The certified cause of death was Inflammation of the Brain and Convulsions.

There was a tremendous number of flies at this house. It appears to me not unlikely that Enteric Fever was interposed in this infant in the course of a more *chronic illness*.

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270, f. æt. 16. Hulme. Onset October 17th. Notified October 20th. Test +.

Case 259, sister of the above, was removed to Monsall suffering from Enteric on October 17th, her illness having begun October 6th. The sisters had not slept together for 3 weeks prior to October 17th.

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271, m. æt. 10, Ardwick. Onset. October 6th. Notified October 24th. Test +. Removed to Chorlton Union Hospital.

There is here no history of infection, properly speaking, and the case is introduced as an example of a source which may, generally, be rejected.

Two years before, a case of Enteric Fever occurred in the next house.

There had been two previous cases at the same school, but they could not well have given rise to the present case.

The child was insufficiently fed, and ate what he could get; for instance, a bad apple off the street, stolen broken biscuits, and so forth. He may, therefore, have had shellfish or other contaminated food.

275, not traced—f. æt 11. Hulme. Onset about October 15th. Notified October 27th. Test +ive.

A sister of case 275 (age 14 months). Ill about 3 weeks. Onset November 4th; had Diarrhœa and apparently fever. No test made.

278, m. æt. 36. Crumpsall. Onset October 14th. Notified October 30th. Test + incomplete.

Son (æt. 3) was ill for a week, beginning August 5th; had Inflammation of the Tonsils and Inflammation of the Bowels; very feverish; no Diarrhœa.

At this house the midden adjoins, and occupants complain of foul smells, and of liquid percolating through.

Between two and three weeks before the commencement of his illness, case 278 had steamed mussels bought from a passing hawker. All the family partook, though patient had most.

He also had celery about a fortnight prior to the commencement of his illness.

280, f. 32. Bradford. Onset October 21st. Notified October 30th. Test +.

Subsequent case 57, 1906.

Case 291, m. æt. 14. Openshaw. Onset October 12th. Notified November 7th. No test. Died November 6th.

This case was not traced, but is given as an illustration of the obscurity attaching to some of these illnesses.

Case 291 visited and read to a boy who had a 10 weeks' illness. Apparently this boy's illness roused some suspicion of Enteric, since a specimen of blood was taken from his ear, which, presumably, gave a —<sup>ve</sup> reaction. His illness was characterised by enlarged glands, swollen abdomen, vomiting, delirium, and diarrhoea. The Medical Attendant states that the cause of death was Splenic Leucocythæmia. "The illness started with enlarged cervical and inguinal glands. The liver and spleen were tremendously enlarged, and towards the end of his illness he suffered from Purpura Hæmorrhagic and Diarrhoea."

Other illnesses followed that of case 291 in the same house:—

(1)—m. æt. 9. Onset November 18th. This child had, apparently, fever for two or three days, and pains in the abdomen.

(2)—m. æt. 48. A few days' illness, with Diarrhoea on one day, beginning November 16th.

(3)—f. æt. 3. Had a bad cold.

Samples of blood from each of these gave a --<sup>ve</sup> reaction. It is probable that, in this instance, we had not to deal with Enteric Fever at all.

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#### Cases 292—332.

Case 292, f. æt. 35. West Gorton. Onset October 12th. Notified November 7th. Test +. Removed to Monsall Hospital November 8th.

The sister of this patient often visited, and spent evenings with, a young man lying ill of Enteric in the adjoining district of Gorton, whose attack began about the middle of September. This young woman was not herself ill. The two sisters slept together, and their skirts were placed on the bed.

This house, as well as the houses adjoining, are served by privy middens in a defective state. The back is separated by a passage from, and is nearly opposite to, two houses in another street in which there were 4 cases of Enteric in 1904. The number of flies has been tremendous.

We cannot, therefore, affirm that the intermediate conveyance of Enteric infection is the only way in which this girl could have been attacked.

The mother of case 292, æt. 63, is now ill with general pains, vomiting, Diarrhoea, and thickly coated tongue (November 8th). A specimen of her blood gave a —<sup>ve</sup> reaction.

Case 332, f. æt. 26. The sister above-named as possibly the intermediate conveyer of infection. Took ill December 1st, and her attack was notified on December 20th. Test +.

It may very well be, therefore, that her mother had Enteric Fever.

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## SERIES 23.

Group 298, 299, 300, 318.

1.—Case 318, f. æt. 4. Newton Onset about September 20th. Notified December 6th. Diagnosed Inflammation of the Brain. Sample taken December 6th. + incomplete. House (A).

2.—Case 298, f. æt. 28. Mother of above. Took ill about October 18th. Notified November 10th. Test +. House (A).

This patient was intimate with the next case, was frequently in her house, and used the closet up to October 30th.

3.—Case 300, f. æt. 18. Onset about November 3rd. Test +. House (B). This case was not only visited by case 298, but also visited house (A). These houses are in the same street.

4.—Case 299, f. æt. 8. House (A). Test +. Onset November 4th. Notified November 10th.

5.—M. æt. 30. Husband of 298. Had slight Diarrhœa about November 11th. No test made.

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303, m. æt. 11. Newton. Onset November 7th. Notified November 16th. Test +.

Father died October 23rd, 1905. Subject to Bronchitis. Began to be ill on October 4th, 1905, with an attack of Bronchitis, which his wife considered different from any previous attack. He had pain in the stomach on eating, and brought his dinners home unused; had headache, and suffered from Diarrhœa throughout.

Brother of case 303, æt. 16. Had an influenza cold, beginning October 16th. No Diarrhœa. Test —<sup>ve</sup>.

Mother had an Influenza cold, beginning October 26th. Test —<sup>ve</sup>.

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305, m. 32. Newton. Onset October 30th. Notified November 20th. Test +.

This man frequented a public-house visited also by an Enteric case—case 267—who began to be ill on October 8th, and also by a Corporation disinfecter. —(See also mussels.)

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307, m. 29. Ancoats. Onset October 30th. Notified November 21st. Test +. (Mussels.)

Subsequent illnesses. Sister, æt. 33, had Inflammation of the Lungs, headache, pain in the stomach, anorexia, beginning November 2nd. Test —<sup>ve</sup>.



Also nephew, æt. 14. Had a slight illness beginning October 30th, attended with shivering, headache, and pain in the stomach. Test —<sup>ve</sup>.

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309, f. æt. 9. West Gorton. Onset November 4th. Notified November 24th. Test +. Attended a school in this district. A child in the same class came from an infected house in Gorton, was away 8 weeks, and returned in October. The teacher cannot say whether she had been ill, but it has not been usual to keep children away from school for prolonged periods on account of Enteric Fever in another child.

There have been other cases in this neighbourhood recently. Two other children from one of these houses attended the same school as case 309, and are friendly with case 309. One of these began to be ill with Enteric about the end of October, and another on November 22nd. Their illness was contracted from an earlier case at home, who may have been the source of the illness of 309, either by their clothes being soiled, or else, perhaps, through case 309 visiting their home.

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#### SERIES 24.

Group 314, 315, 321, 322, 323.

The history of these illnesses has not been obtained, the above cases having been removed to the Chorlton Union Hospital.

The first member of the family to be ill was a little girl (æt. 5) who lived at an aunt's in Salford, and there passed through an illness of 5 weeks duration, in the course of which she was visited by other members of the family. No test. House (B).

Another case (315), m. æt. 1½. Chorlton-on-Medlock. Took ill November 25th; was notified on December 5th; removed to Chorlton Union Hospital on December 11th. Test +. House (A).

Case 314, m. æt. 30, the father. Took ill December 1st; notified December 5th; removed December 11th. Test + incomplete. House (A).

Case 321, f. æt. 12. Took ill December 2nd; notified December 11th; removed December 12th. Test —<sup>ve</sup>. The Medical Officer states that undoubtedly this child had Enteric. House (A).

In case 322, æt. 7, and case 323, f. æt. 30, the dates of onset were not ascertained. House (A).

A neighbour's child, a girl æt. 2, was ill for a fortnight, starting about December 22nd; loss of appetite, feverishness, Diarrhoea. Serum test —<sup>ve</sup>. House (C).

Also the father of case 314 (æt. 70) had an illness lasting about a week, from December 23rd to January 4th, 1906. Test —<sup>ve</sup>.

On the surface of the passage behind these houses the investigator counted seven patches of excreta, an illustration of the negligence which causes the disease to spread to fresh families.

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#### SERIES 25.

Group 320 and others (*see* 309, 264, 249).

1.—F. æt. 2. Began to be ill about the middle of October; excessive vomiting and fever; illness lasted 2 weeks. Specimen taken in the end of December gave a + reaction. House (A).

2.—F. æt. 4. Onset about the end of October; Diarrhœa, vomiting, fever, pains in the abdomen. This child slept throughout in the same bed with the mother. Test +. House (A).

3.—Case 320. West Gorton. Onset November 10th. Notified December 11th. Test +. Mother of the children. House (A)

4.—F. æt. 11. Onset November 22nd; pain in abdomen, fever, languid, Diarrhœa. Test end of December +.

5.—M. æt. 38. Husband of case 320. Onset November 15th; vomiting and Diarrhœa; off work a few days. Test in the end of December —<sup>ve</sup>.

Cases 1, 2, 4, and 5 were discovered at the visits from the Public Health Office.

The first of the above cases was a favourite of, and was often nursed by, case 249, a child 5 years old, who was removed to Monsall on October 13th. This child would probably be in house (A) during her illness. It is only three doors off from her home, and lies between her home and her grandmother's house, in which she spent the daytime.

Case 309, we have already seen, may have been infected by 2 and 4 of the above series, indirectly, or, if she visited her playmates at home, directly by 1.

6.—Whilst visiting the above house, the Inspector observed an ailing girl come into the house, and on enquiry found that she had passed through an illness of 7 weeks duration, beginning October 31st.

The medical attendant at first pronounced it to be Enteric Fever, but later regarded it as Pneumonia. Pains in the stomach and bowels, headache, very feverish, deaf, anorexia, delirium; no Diarrhœa.

No test appears to have been taken, but there can be little or no doubt that this was an attack of Enteric Fever, contracted, no doubt, from one of the above series.

During the visit the Inspector observed the child, æt. 2, pick up bits off the floor and eat them.

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328, f. æt. 19. St. George's. Onset about December 9th. Notified December 15th. Test +. Discovered ill by the Sanitary Inspector.

Contracted from nursing her sister, case 308.

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330, m. æt. 13. Bradford. Onset November 23rd. Notified December 8th. Test +. A case of Enteric Fever occurred in this house 12 months previously. The floor of the pail closet is very dirty. This boy had food outside unknown to parents.

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333, f. æt. 10. Hulme. Onset December 12th. Notified December 20th. Test +. The father of this patient died at another house of Phthisis on September 29th. He had much Diarrhœa, and there is said to have been blood in his motions during the last week of his illness. It is possible that there was intercurrent Enteric here.

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338, m. æt. 2. Bradford. Onset December 15th. Notified December 27th. Test +.

The primary case was the father of this child. Onset end of September. He had all the symptoms of Enteric, and the medical attendant now recognises that this was the real nature of the attack. No sample taken.

The father appears to have been infected by eating mussels.

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339, f. æt. 22. West Gorton. Onset November 30th. Notified December 28th. Test +.

The husband was an inmate of the Royal Infirmary for 5 weeks prior to the end of October, 1905. Whilst there he suffered from pain in his head and stomach. He is now (January 11th, 1906) delirious. Has had loose motions since his return from the Infirmary. Specimen taken —<sup>ve</sup>. Patient was sent into Monsall, and a subsequent specimen gave a + ? reaction. This case was notified as Enteric in 1906.

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340, f. æt. 16. Rusholme. Onset between November 18th and November 25th. Notified December 8th. Not removed. Tests —<sup>ve</sup>, —<sup>ve</sup>, —<sup>ve</sup>. Onset marked by languor, headache, anorexia, pain in the stomach, shivering, cough, subsequently excessive vomiting and fever. No Diarrhœa, nor deafness. Spat blood about 4 weeks after the onset of illness. Medical Attendant adheres to his opinion.

A workmate had passed through an illness attended with fever and Diarrhœa. Gave up work on November 11th. Often visited at home by case 340. No test.

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## SHELLFISH AND ENTERIC FEVER.

## SHELLFISH PARTICULARS, 1905.

No. of case	District	Sex	Age	Class of Shellfish	Date of Illness	Interval between consumption of Shellfish and Illness	Raw	Cooked	Others consuming	Other source	Retailer	Wholesale Vendor	Reaction
8	Hulme	m.	30	Mussels	December 14	Mussels used habitually	Yes	...	No	Mother had influenza	Hulme 1	A	+
16	Hulme	m.	22	Mussels and Whelks	January 10	About 3 weeks	Yes	...	Brother	...	?	?	+
23	Newton	m.	19	Oysters, American	January 7	4 to 3 weeks	Yes	...	No	...	Newton 1	B	+
26	Hulme	m.	20	Mussels	January 5	19 days	Steamed	...	Companion 1 or 2. They did not taste nice	...	Hulme 2	C	+
27	Central	m.	14	Mussels	January 12	19 days	Yes	...	Companion	...	Beswick 1	A	+
28	Newton	m.	27	Oysters	January 14	14 or 20 days	Yes	...	See case 23 No	...	Newton 1	B	+
29	Hulme	f.	34	Mussels	January 1	11 days	Steamed	...	A friend See case 8	...	Hulme 1	A	+
47	Hulme	f.	23	Mussels	January 27	10 days	Yes?	...	Yes	...	Hulme 3	B	+
52	Openshaw	m.	18	Mussels	February 4	6 days	Hot	...	No	...	Openshaw D	I	+
55	Moss Side	m.	30	Mussels	January 28	17 days	Yes	...	No	...	Hulme 3	B	—
56	*Bradford	f.	34	Mussels	February 4	7 and 3 days	Yes	...	Husband	...	Beswick 2	C	+

# SHELLFISH PARTICULARS—continued.

No. of case	District	Sex	Age	Class of Shellfish	Date o. Illness	Interval between consumption of Shellfish and Illness	Raw	Cooked	Others consuming	Other source	Retailer	Wholesale Vendor	Reaction
58	St. George's	f.	25	Mussels	February 6	17, 16, and 9 days	Yes	...	? Friend	...	H ?	?	
61	*Bradford	m.	32	Mussels	Two, February 5 and Feb 1 to 8	8 days, and about same	Yes	...	Husband and wife	? Direct infection	Beswick 2	C	+
64 and 59	Central	f.	4	Mussels	February 27	11 days	...	Yes	Fred, æt 3, and Father	Infecti'n?	H	?	
68	*Hulme	m.	15	Mussels. Also m. æt. 16	February 27 and 28	Date omitted: 2 to 3 weeks before	Yes	...	Only these two	The other had an illness exactly like	H	B and C	+
70	Beswick	f.	30	Mussels	February 25	14 and 7 days	Yes	...	No	...	Beswick 1	A	+
71	*St. George's	f.	27	Mussels	March 3	Used frequently	Yes	...	No	...	H	?	+
73	*Moston	m.	35	Mussels	March 2	10 and 17 days	Yes	...	? Wife	...	Harpurhey 1	D	+
82	Bradford	f.	45	Mussels	March 17	27 days and less	Yes	...	No	...	Bradford 1	A	+
84	Moston	f.	30	3 Mussels, also Cockles	March 13	20 days	Yes	...	A brother	...	Moston 1	D	+
87	Ardwick	f.	27	6 Oysters	March 9	12 days	Yes	...	No	...	Openshaw D	I	+
98	Hulme	m.	19	Mussels	March 14	10 days	Yes	...	No	...	?	?	
99	St. George's	m.	38	Mussels	March 17	13 days	Yes	...	Companion	...	St. George's 1	D	+

The original of case 81 was probably infected by Mussels.

## SHELLFISH PARTICULARS—continued.

84

No. of case	District	Sex	Age	Class of Shellfish	Date of Illness	Interval between consumption of Shellfish and Illness	Raw	Cooked	Others consuming	Other source	Retailer	Wholesale Vendor	Reaction
105	Ancoats	m.	38	Mussels	March 4	14 days	Yes	...	No	...	Ancoats 1	A	+
111	Openshaw	m.	20	Mussels	March 22	11 days	Yes	...	No	...	Openshaw D	I	+
112	Chorlton-upon-Medlock	m.	16	Mussels	April 8	A fortnight	Yes	...	No	...	Beswick 2	C	+
113	Chorlton-upon-Medlock	m.	22	Mussels, a large quantity	April 8	A fortnight	Yes	...	No	...	Hulme 4	D	+
116	Ardwick	m.	45	Mussels	March 29	11 days	Yes	...	?	...	Openshaw D	I	+
117	Hulme	f.	26	Mussels	April 7	14 days	Yes	...	A friend	...	Hulme 4	D	+
120	*Openshaw	m.	25	Mussels	April 3	9 days	Yes	...	No	...	Central 1	?	+
122	At coats	f.	15	Mussels	March 31	About 2 weeks	Yes	...	Father	...	H'	?	+
123	Ancoats	m.	24	Mussels	April 13	12 and 5 days	Yes	...	No	...	Ancoats 2	B	+
127	Chorlton-upon-Medlock	m.	43	Mussels, 3 or 4	April 3	10 or 17 days	Yes	...	None raw	...	Chorlton-up'n-Medlock 1	B	+
132	Ancoats	f.	26	Mussels	April 22	13 and 15 days	Yes	...	Husband	...	Newton 1	B	+
133	St. George's	m.	33	Mussels	April 15	11 days and frequently	Yes	...	Not raw	...	St. George's 2	E	+
134	St. George's	f.	42	Mussels	April 25	Within 3 weeks of last date	Yes and	C'ked	No	...	St. George's 2	E	+
140	*Hulme	f.	19	Mussels	April 19	*Uncertain	Yes	...	?	...	Hulme 5	A	+



SHELLFISH PARTICULARS—*continued.*

No. of case	District	Sex	Age	Class of Shellfish	Date of Illness	Interval between consumption of Shellfish and Illness	Raw	Cooked	Others consuming	Other source	Retailer	Wholesale Vendor	Re-action
141	*Ardwick	m	26	Mussels	April 5	11 days & 18 days	Yes	...	? No	...	Openshaw D	I	+
142	Chorlton-upon-Medlock	f.	13	Mussels	April 24	9 days	Yes	...	A whole family	...	Hulme 4	D	+
143	*Ancoats (see sheet)	m.	28	Mussels	April 26	12 or 19 days	Yes	...	A friend	...	Newton 2	C	+ ?
144	*St. George's t	m.	22	Mussels	April 23	6 and 14 days	Yes	Also had M. from a stall in Oak Street. (168)	Two friends	One of these also developed enteric	Newton 1	B	+
150	Moston	m.	26	Mussels	April 29	14 days	Yes	...	Wife	...	St. George's 2	E	+
159	St. George's	m.	29	Mussels	May 9	10 days	Yes	...	No	...	St. George's 2	E	+
162	Blackley	m.	38	Mussels	April 30	2 to 3 weeks before	Yes	...	No	...	St. George's 2	E	+
163	St. George's	m.	33	Mussels	May 10	About 14 days before	Yes	...	No	...	St. George's 3	E	+
168	*Chorlton-upon-Medlock	m.	19	Mussels	April 25	10 days	Yes	...	No	...	Central 1	C?	+
173	Chorlton-upon-Medlock	m.	26	Mussels	April 14	Often consumed them	Yes	...	No	...	Hulme 5	B	+
171	Newton	m.	18	Mussels	April 23	6 and 14 days	Yes	...	Case 144	...	Newton 2	C	+

## SHELLFISH PARTICULARS—continued.

No of case	District	Sex	Age	Class of Shellfish	Date of Illness	Interval between consumption of Shellfish and Illness	Raw	Cooked	Others consuming	Other source	Retailer	Wholesale Vendor	Reaction
187	Ancoats	f.	20	Mussels	July 8	Ate raw Oysters often and Mus-sels almost every night	Yes	...	?	...	Ancoats 2	B	+
192	Newton	m.	14	Mussels	July 16	Date uncertain	Yes	...	...	...	Newton 1	B	+
198	Ancoats	f.	21	Mussels	July 23	15 days	Yes	...	...	...	Beswick 2	C	+
204	Ardwick	m.	36	Whelks	August 17	Between 2 and 3 weeks	...	Yes	...	...	Openshaw D.	I	+
209	St. George's	m.	26	Oysters	August 27	15 and 8 days	Yes	...	...	...	Central 2	?	+
215	Bradford	m.	23	Mussels	August 21	10 days	Yes	...	...	...	Beswick 2	C	+
220	West Gorton	m.	30	Oysters	August 6	15 days	Yes	...	...	...	Outside	...	+
224	St. George's	m.	12	Cockles	September 5	21 days at least	?	?	Contracted near Dublin	...	Outside	...	+
227	Newton	m.	6	Whelks	September 10	Holidays July 12 to Sept. 10	?	...	Contracted near Belfast	...	Outside	...	+
229	St. George's	m.	29	Oysters	September 12	17 or 10 days	Yes	...	...	...	Ancoats 1	A	+
232	Ardwick	m.	39	Whelks	August 23	11 days	?	?	...	...	Central 1	?	+ inc.
228	Ardwick	m.	37	Mussels	September 17	8 days	Yes	...	...	...	H	?	{
186*	Moss Side	m.	?	Mussels	April 25	14, 13, 12, 11, or 10 days or less	Yes	...	...	...	Moss Side	B	Not taken

\* Supposed origin of

SHELLFISH PARTICULARS—continued.

No of case	District	Sex	Age	Class of Shellfish	Date of Illness	Interval between consumption of Shellfish and Illness	Raw	Cooked	Others consuming	Other source	Retailer	Wholesale Vendor	Reaction
Father of 338 apparently		had		Enteric Fever, traced with probability		ability to eating raw	Mussels		...	...	Beswick 3	...	o
240	Bradford	m.	25	Oysters	September 21	18, 17, 16, 15, and 14 days	Yes	...	One friend	...	Outside	...	+
241	Ardwick	f.	5	Mussels	September 16	About 2 weeks	...	Heat-ed on bar	?	...	Picked off street	...	+ inc.
246	Openshaw	m.	22	Mussels	September 19	13 days	Yes	...	No one	...	Gorton Wake-	...	+
252	Chorlton-upon-Medlock	m.	25	? Patient died	September 29	Within a fortnight	?	...	No one	...	Outside	—	+ inc.
254	Rusholme	m.	29	Oysters	September 12	14 days	Yes	...	No one	...	Central 3	F??	+
256	Moss Side	m.	39	Mussels	October 1	12 days	Yes	...	No one raw	...	Moss Side 2	D	+
258	Newton	m.	18	Mussels	September 19	15 days	Yes	...	Alone	...	Central 4	B	+
259	Hulme	f.	12	Mussels	October 6	11 or 4 days	...	Steam-ed	Rest of family	...	Hulme 6	G??	+
263	Cheetham	f.	19	Mussels	October 4	11 days	Yes	...	Father (very ill 2 days)	...	St. George's 3	E	+
249	West Gorton	f.	5	<i>One mussel from street</i>	October 13	2 to 3 weeks	...	Heat-ed	No	...	Street	?	+ inc.
269	Cheetham	f.	28	Mussels	September 30	Had Mussel every day from Sept. 1—a quart on September 16	Yes	...	No	...	H	?	+



## SHELLFISH PARTICULARS—continued.

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No of case	District	Sex	Age	Class of Shellfish	Date of Illness	Interval between consumption of Shellfish and Illness	Raw	Cooked	Others consuming	Other source	Retailer	Wholesale Vendor	Reaction
265	Rusholme	m.	27	Mussels	?	September 2	Yes	...	Wife, also Enteric case 257,	...	Gorton Wakes	...	+
257	?	...	...	...	...	...	...	...	...	...	...	...	...
273	Blackley	f.	28	Mussels—a quart	October 16	2 weeks	Yes	...	Brother	...	H	? ?	+
280	Bradford	f.	32	Mussels—quart shared	October 21	14 days	Yes	...	Friend	...	Beswick 2	C	+
281	Hulme	m.	37	Mussels	October 16	13 days	...	Steam-ed	Wife	...	Hulme 7	B	+
282	St. George's	m.	32	Mussels	October 20	13 days	Yes	...	No	...	Central 1	A	+
283	Ancoats	m.	24	Mussels	October 9	10 days	Yes	...	No	...	Ancoats 1	A	+
284	St. George's	m.	15	Mussels	October 17	10 days	Yes	...	Two companions	Trashy food—visited many houses in Gorton	Central 1	A	+
285	Crumpsall	m.	18	Mussels	October 24	10 days	Yes	...	? ?	...	St. George's 3	E	+
286	Beswick	m.	26	Mussels	October 25	11 days	Yes	...	Father	...	Beswick 1	A	+
289	Beswick	m.	27	Mussels	October 7	14 days	Yes	...	No	...	Central 1	A	+
290	Chorlton-upon Medlock	f.	45	Mussels and Oysters	November 1	At week ends	Yes	...	...	...	?	?	+

SHELLFISH PARTICULARS—*continued.*

No of case	District	Sex	Age	Class of Shellfish	Date of Illness	Interval between consumption of Shellfish and Illness	Raw	Cooked	Others consuming	Other source	Retailer	Wholesale Vendor	Reaction
296	St. George's	m.	23	Mussels	October 31	2 to 3 weeks	Yes	...	No	...	Newton 2	C	+
297?	St. George's	m.	18	Oysters	October 22	About 2 weeks	Yes	...	No	Much raw vegetables, etc.	H	?	+
298	Newton	f.	28	Mussels	October 20	Often ate Mussels and drank beer	Yes	...	No	?	H	?	+
303?	(origin of) Newton	m.	?	Mussels	October 4	2 to 3 weeks	Yes	...	No	...	Newton 2	A	o
305	Newton	m.	32	Mussels	October 30	About 3 weeks	Yes	...	No	...	H	?	+
307	Ancoats	m.	29	Mussels	October 30	16 days	Yes	...	No	...	Central 1	A	+
310	Ardwick	m.	18	Mussels	November 11	14 days	Yes	...	Two companions	...	Beswick 3	A	+
311	St. George's	m.	24	Mussels	November 10	6 days and 13 days	Yes	...	No	...	Hulme 5	A	+
316	Ancoats	m.	33	Mussels	November 13	11 days	Yes	...	No	...	H	?	+
317	Ardwick	f.	16	Mussels	November 21	13 days	Yes	...	Family (boiled)	...	H	?	+
319	Ancoats	m.	33	Mussels	November 26	8 days	Yes	...	No	...	Ancoats 1	A	+
324	Bradford	m.	27	Mussels	November 30	About 3 weeks	Yes	...	?	...	Newton 1	B	+
325	Hulme	f.	37	Oysters	December 1	15 or 16 days	Yes	?	? From baby	...	Hulme 8	A	+

## SHELLFISH PARTICULARS—continued.

No of case	District	Sex	Age	Class of Shellfish	Date of Illness	Interval between consumption of Shellfish and Illness	Raw	Cooked	Others consuming	Other source	Retailer	Wholesale Vendor	Reaction
326	St. George's	f.	36	Mussels	November 21	7 or 14 days	...	Steamed	...	...	H	?	+
278	See under history of infection				...	...	...	...	...	...	...	...	...
335	Bradford	m.	13	Mussels	December 14	Boy too dull to give exact information	...	...	Father hawks	Mussels	H	?	+
336	Newton	f.	12	Mussels	November 13	Had Mussels daily for months	Yes	...	...	...	?	?	+
337	Ardwick	m.	28	Mussels	December 11	6 days	...	Yes	...	...	?	?	+
338	Bradford (origin of case, father)	m.	24	Mussels	September 27	18 or 11 days	Yes	...	Wife	...	Beswick 3	A	o



In exhibiting the history of the connection of cases with shellfish, I have substituted for the name and address of the retail vendors of the particular purchase incriminated the name of the Sanitary District in which the shop was situated, and after it a number to indicate the individual shop in the district. It will be seen that certain shops are marked out conspicuously. That is because they obtain their mussels from particular sources. Central 1 is not a shop, however, but a group of stalls near the market.

It will be noted that in no fewer than 70 out of 103 cases we have been able to trace the shellfish to the wholesale dealer.

I placed the facts before the wholesale dealers concerned, and asked them to furnish me with the names of the layings from which supplies were furnished to the retail shops implicated on the dates mentioned. The answers were most unsatisfactory. I was informed that it was not possible to give this information except in very general terms. One gentleman informed me that it was impossible to trace these cases, as men got too much beer in public houses, and ate mussels off street hawkers when they came out, forgetting all about it next day. This, I believe, to be quite true, and it will, no doubt, account for a proportion of the untraced cases. But, as will be seen, it was found possible in no fewer than 70 cases to trace the particular repast, which was alone believed to come within the conditions of infection, to the wholesale dealer.

When we have reached the wholesale dealer, we have got very little further unless he will assist the Public Health Authority to protect the public.

No hawker should be allowed to sell shellfish unless his name and address are conspicuously attached to his barrow. A wholesale dealer should record in a book every purchase made from him by a retailer or hawker, giving the name of the laying from which the purchase has come, and the name and address sufficiently for identification of the retailer by whom the purchase is made, with date of purchase.

There is not, and should not be allowed to be, any difficulty about the matter. Although, however, precise and clear detailed information has not been forthcoming, there has been sufficient to call attention to layings on the Welsh and Irish coasts as probable sources of pollution, and I should not now be satisfied of the contrary without either personal examination or examination by the Local Government Board.

Meantime, the Local Authority should be in a position to require, as a right, the name of the laying from which any suspected supply has come.

Powers were asked for in the 1906 Bill (rejected by the ratepayers) to get the necessary information. They should be a necessary part of any new Public Health Act.

I have named the wholesale dealers alluded to by letters A, B, C, D, E, etc. The supplies in connection with Enteric cases were traced back to these dealers, thus:—

A	..	..	..	19	D	..	..	..	7
B	..	..	..	15	E	..	..	..	8
C	..	..	..	12	I	..	..	..	6
B and C				..	..	..	..	..	1

F and G have each 1, but these may be regarded as very doubtful cases, so far as shellfish infection is concerned.

These are, with the exception of D and I, the same gentlemen to whose supplies our inquiries pointed in 1904. I imports his own shellfish direct.

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The distribution of the names of these gentlemen on the list is not without significance.

There is a decided tendency of the cases to come in rushes. Thus—

D has cases 73, 84, 99, 113, and 117 out of the 7.

A has 282, 283, 284, 286, 289,—307, 310, 311, 319, 325, and, the father of 338.

B has 23, 28, 47, 55, 68,—123, 127, 132,—173, 187, 192.

E has 133, 134,—150, 159, 162, 163.

C and I are more scattered.

This would seem to show that now one, now another, supply becomes specifically polluted. All these occurrences should be open to the most minute inquiry.

There has not been in 1905 that complete separation of cases coming into relation with shellfish from cases which might have been infected from some other known source which was found in 1904. Considerable stress was laid on that fact, as adding to the evidence that mussels had largely to do with the causation of the cases brought into relation with them.

Although the two sets of cases are not entirely separated, their points of contact only number 5. These are cases 8, 27, 59 and 64, 56 and 61, 159. In the first three cases the histories of direct infection are less convincing than the relation to shellfish. In the last two there is real doubt as to which source we must choose.

The separation of the two sets of figures in 1905 is wide enough to justify us in still claiming it as proof of the causative action of mussels.

The history of consumption of shellfish is in detail as follows :—

*Account of the remaining Untraced Cases.*

In order to economise space, I have cut out the histories of 12 untraced cases who contracted the disease outside Manchester, 23 whose illnesses were not specially investigated, or in respect of whom only the most meagre details could be obtained, and 10 who gave some history of direct infection. I have retained, however, 2 who will be found not in the untraced but in the shellfish column. The particulars relating to the remaining 37 cases may be summarised as in the following abstract :—

It will be found that certain cases—viz., 4, 101, 129, 130, 138, 181, 206, 252, 304, 306, 313—are in connection with defects or conditions of drains, etc., such as in reconstruction of closets or of drains, or in poking at an infected drain, which would be liable to produce Enteric Fever. Still, other special conditions are: 48, a stripper after infectious disease; 72, had to use a variety of closets; 222, privy midden and numerous flies; 330, Enteric Fever at this house a year before, ashplace floor very dirty; 331, house built on a tip—Enteric Fever in this house 3 years ago; 334, pail closet, ashplace floor sunken and wet.

In several instances the disturbance of polluted soil has appeared to give rise to Enteric Fever.

A number partook of watercress prior to their attack—146, 151, 172, 178, 184, 275, 293. It appears worth while noting these histories, as it becomes necessary to consider watercress in this connection. In one or two cases garbage was picked up and eaten by children. In others fruit might possibly have been the infecting agent.

It appears desirable to give these remaining particulars, as they do adumbrate the directions in which we might look for infection.

Flies are especially designated in some cases as possible transmitters of infection.

*Abstract of Remanent Cases.*

*Cases untraced in 1905.*

Case 1, m. æt. 15. Hulme. Onset about December 23rd, 1904. Notified January 4th. Test +. Not specially investigated. Was in the employ of a rag merchant in Salford.

Case 4, f. æt. 7. Cheetham. Onset about December 18th, 1904. Notified January 7th. Test +. Water-closet stopped, and smelled offensive when the family of which this case was a member took the house. The cleansing



was not commenced till December 19th, 1904. Father is a fish hawker. Information difficult to obtain. It is probable that this child was infected at one or other of the closets used, or at the offensive stopped closet.

Case 48, m. æt. 23. Moss Side. Onset January 29th. Notified February 14th. Test + incomplete. Patient is a stripper after infectious diseases. No special investigation. Patient removed to Chorlton Union Hospital.

Case 69, m. æt. 45. St. George's. Onset March 2nd. Notified March 9th. Test +. Has been a heavy drinker. ? Shellfish ? ? No special investigation.

Case 72, m. æt. 42. Hulme. Onset February 4th. Notified March 13th. Test + incomplete. Not traced. Driver of a lorry. Had food away from home, and would have to use a variety of closets. Removed to Withington, and consequently personal information not obtainable.

Case 101, m. æt. 32. Chorlton-on-Medlock. Onset March 22nd. Notified March 30th. Test +. Worked in filthy water in trenches for 14 days before the commencement of his illness. An attack of Diarrhœa occurred in this house a year before. Pail closet adjoins.

Case 129, m. æt. 18. Ancoats. Onset April 15th. Notified April 28th. Test +. New closets fixed in March. Enteric Fever in this row 15 months ago.

Case 130, m. æt. 35. Newton. Onset April 15th. Notified April 29th. Test +. Often ate cooked periwinkles on Sunday. House kept in a very dirty condition. New drains have recently been laid in connection with the works at which he was employed.

Case 138, f. æt. 5. Newton. Onset April 12th. Notified May 1st. Test +.

A case of Enteric Fever occurred at the back of a neighbouring house in December, 1904, in connection with which the Inspector observed that the pail was leaking. This child used to play at the back of the houses and poke the traps with a stick. That opposite the house named was defective and dry, and the one opposite his own house was blocked.

Case 146, m. æt. 10. Cheetham. Onset May 3rd. Notified May 10th. Test + incomplete. Infected outside Manchester, in all probability, but he had been in the Boys' Refuge, Strangeways, 8 days, and a number of boys have formerly come from here. Doubtful article consumed—watercress. No information was obtained from the district outside.

Case 151, f. æt. 32. Ancoats. Onset May 1st. Notified May 12th. Test +. Patient went regularly to Infirmary once a week for 9 months prior to the onset of this illness, suffering, apparently, from Nervous Dyspepsia. Had raw

unwashed grapes every Saturday night. Had also watercress about a fortnight before the commencement of her illness. The sources of supply were traced, but I do not personally know the bed. The slightest infection would, no doubt, have taken effect in her weak state. The house is served by a pail-closet.

Case 172, m. æt. 29. St. George's. Onset May 8th. Notified June 13th. Test +. Had watercress almost every day.

Case 178, f. æt. 28. Ardwick. Onset May 24th. Notified June 17th. Test +. Ate a great quantity of watercress. Had also ice cream.

Case 181, m. æt. 28. Chorlton-on-Medlock. Onset June 10th. Notified June 23rd. Test + incomplete. Has lately been in bad health. Is a plumber. Worked at a public-house from May 29th to June 2nd, and there took out an old pan-closet. The closet was filthy. His hands were not washed before he ate his food—merely wiped on his trousers.

Case 184, m. æt. 10. Ancoats. Onset June 23rd. Notified July 1st. Test + incomplete. Fond of watercress. Had some on June 5th, and probably also on other occasions. Died.

Case 188, m. æt. 27. Beswick. Took ill about July 1st. Serum test +.

On June 17th, on returning home, was sick. Probably had too much beer. Did he have mussels from a hawker outside the public-house?

Case 197, m. æt. 44. Moss Side. Onset August 2nd. Notified August 9th. Test +.

There are a tremendous number of flies here.

F. æt. 20, at the same house, had an illness, which began on July 24th, 1905, and lasted 3 days, characterised by headache, pains in the stomach, and Diarrhoea. No test made.

A workmate and friend has been off ill since July 28th to now (August 9th); illness characterised by anorexia, headache, languor, vomiting, excessive Diarrhoea, and Fever. Motions said by this man to be like pea-soup. Test taken August 15th —<sup>v</sup>.

This report is by the District Inspector.

Case 200, f. æt. 32. St. George's. Ill about August 7th. Notified August 23rd. Tests +.

Lettuce eaten with husband 2 to 3 weeks before onset. There is a possibility that lettuces may be contaminated while being washed. The flies are numerous.

Case 206, m. æt. 18. West Gorton. Ill August 21st. Notified August 30th. Tests + ?, +.

Ate plentifully of plums from a greengrocer's at which a baby died of Diarrhœa on July 29th.

From August 2nd to August 9th visited Gorton Wakes. There was much Enteric Fever in Gorton last autumn.

This house is very dirty, and flies very numerous. There is a rag-shop about 50 yards away. The cellar of the house was flooded on July 9th.

Case 221, f. æt. 47. Newton. Onset about August 7th. Notified September 10th. Serum test +.

Nursed her father-in-law from about June 22nd to June 30th. Death from senile decay. Mother-in-law died August 17th of "Peripheral Neuritis." Medical Attendant declares that they did not have Enteric. Their home was in the midst of a colony of Enteric in 1904.

Case 222, m. æt. 28. Bradford. Onset August 31st. Notified September 11th. Test +.

Was accustomed to have whelks from a particular shop.

The closet is a privy-midden, and flies are numerous.

Case 242, m. æt. 9. Rusholme. Onset September 17th. Notified October 2nd. Test +.

This boy's family removed from Gorton on August 18th, and his friends lived there. It will be remembered that there was a large number of cases in that part of Gorton, which is outside the City. On September 2nd he visited Gorton Wakes, and purchased some eatables at the fair.

Case 252, m. æt. 25. Chorlton-on-Medlock. Onset October 1st. Notified October 12th. Test + incomplete.

This patient was too ill, at the visit of the enquirer, to answer questions, and died on November 5th. About two weeks prior to the onset of his illness he was supervising a drainage job, and got a foul smell from the sewer. No history of recent Enteric infection connected with this sewer. He has also had shellfish. (Referred to shellfish column.)

Case 255, m. æt. 32. Rusholme. Onset September 22nd. Notified October 13th. Test +.

No clue was obtained to this patient's illness, and what information was obtained does not appear material.

He was a builder, and was weak with study prior to his illness. He used a large amount of raw, unwashed fruit.



Between 2 and 3 weeks prior to the onset of his illness he had part of an offensive pork-pie.

The street in which his house lies is unpaved, though the house itself is good ; the ground is sodden, and heaps of broken bricks and other refuse are tipped here.

He was in such a weak condition prior to his illness that he thinks he could have contracted his illness "from the air." No clue obtained.

Case 260, f. æt 3. Harpurhey. Onset beginning of September. Notified October 17th. Test +.

This child infected two others in the same family. Her illness was discovered on the visit of the Sanitary Inspector, consequent on the notification of a later case. She had copious Diarrhœa, but kept running about the house. Prior to her illness she is said to have taken something from the ashtub next door, and eaten it. The neighbours say that she has picked things off the street and eaten them.

Case 268, m. æt. 29. Ancoats. Onset in September (?). Notified October 20th. Died October 28th. Test +.

This is a notified case of Phthisis. His illness became worse in August, 1905. On August 7th and 14th he had oysters in the Isle of Man. It is difficult to define the onset of his attack of Enteric, owing to the pre-existing Phthisis.

Case 272, f. æt. 13 months. West Gorton. Onset about September 23rd. Notified October 24th. Test +.

Notified from Withington Hospital. Mother of child a charwoman. The child was allowed to crawl on the floor and street, and to do what she liked. The mother has seen her put her dirty fingers in her mouth. There has been a tremendous number of flies in this house.

Case 275, f. æt. 11. Hulme. Onset October 15th. Notified October 27th. Test + incomplete.

Ice cream often from any passing hawker. The family have watercress every Sunday (from Cambridgeshire). The child ate a lot of unpeeled and unwashed apples and pears.

Case 378, m. æt. 36. Crumpsall. Onset October 14th. Notified October 30th. (?) Due to previous attack in child, who was ill from August 5th to 19th.

Midden-privy adjoins house, and liquid soaks through the wall.

Case 287, m. æt. 28. Hulme. Onset September 30th. Notified November 4th. Test +

No clue obtained. Patient has often dirty and dusty jobs in cleaning out railway carriages.

His workmates mostly live in outer Gorton, where there have been numerous cases, but no history of Enteric in a fellow-workman is known.

Was in Douglas from September 2nd to September 9th.

Case 293, f. æt. 18. Hulme. Onset between September 4th to September 21st. Notified November 8th. Serum test +.

This patient went to a Southport Convalescent Hospital on October 5th, and took ill definitely with Enteric Fever on October 16th. She had some watercress there.

It is doubtful whether this was a relapse, and not a fresh illness.

Case 301, f. æt. 17. Ardwick. Onset about October 31st. Notified November 14th. Test +.

Shrimps about 10 days before onset; would be handled by shellfish dealers. Raw, unpeeled apples from Shudehill Market every Saturday night.

Case 304, f. æt. 22. Moss Side. Onset October 27th. Notified November 17th. Test +.

Father died of "paralysis of the stomach and brain" on October 8th, 1905, and he was nursed by case 304, who has had poor health for months. She was a teacher, and alterations have been going on since July in the school closets and drains, which are near to the schoolroom in which she worked.

Case 306, m. æt. 38. Openshaw. Onset November 6th (?). Notified November 20th. Test +.

Date of onset is, in this case, somewhat indefinite. Patient was ailing some weeks before the more definite onset on November 6th, sufficiently so to prevent him from working.

On some date between September 10th and September 16th he ate a quantity of raw mussels.

Alterations of the middens attached to adjacent dwellings to water-closets began on August 31st. There have been foul smells and a great number of flies. (Referred to shellfish column.)

Case 313, m. æt. 28. St. George's. Onset about November 14th. Notified December 11th. Test +.

Two to three weeks prior to his illness he had to release some closets, which made him sick and ill. The smell "took his breath away."

Alterations from pail to water closets were going on at the house in which he was living when infected.

Case 318, f. æt. 4. Newton Heath. Onset about September 23rd. Notified October 6th. Test + incomplete.

This is an overlooked case, discovered as the first of an infective series. Vomiting, Diarrhœa, etc.

Case 330, m. æt. 13. Bradford. Onset November 30th. Notification December 8th. Tests —<sup>ve</sup>, +.

A case of Enteric Fever occurred in this house 12 months before.

The parents say that he purchased foods outside, unknown to them.

Ashplace floor very dirty.

Case 331, f. æt. 13. Harpurhey. Onset December 7th. Notified December 20th. Test +.

Between 2 to 3 weeks prior to onset ate raw, unpeeled apples, and celery.

Sister had Enteric Fever at this house 3 years before.

House built near a tip, and on tipped refuse.

Case 334, m. æt. 26. Hulme. Onset December 1st. Notified December 22nd. Tests —<sup>ve</sup>, —<sup>ve</sup>, +.

Pail-closet floor sunken and wet. Took plenty of beer. Does not know that he had any shellfish.

*Other Foods besides Shellfish may convey Enteric Fever.*

We have seen that there is some reason to suppose that watercress may have played some part in the propagation of the disease in 1905. A full account is given for most of the cases investigated by Mr. Hewitt of every article which might be supposed to carry with it risk of infection, such as watercress, celery, raw fruit, rubbish, ice cream, potato chips, fried fish, pork pies, so-called 'raw tripe,' which means tripe not re-heated after purchase, lettuce.

I have collected and tabulated these observations, and the result may be applied in the first instance to watercress. A connection is noted in 21 instances between consumption of watercress and the occurrence of Enteric Fever. Thirteen out of the 21 occur in close succession between cases 123 and cases 185; that is to say, chiefly in May and June. This is, no doubt, in part due to this period being watercress season, but only in part.



It is difficult to conceive of any test, short of the proof of danger in the conditions under which the watercress consumed was being produced, which would suffice to enable us to form a decided opinion as to whether infection is thus indicated.

We have seen that the proportion of traced cases, mussel cases, and untraced cases is 44·5, 32·5, 22·9. The corresponding proportions of the 21 cases are 5, 7, 7, or if cases originating outside Manchester be included, 5, 7, 9.

If we restrict our attention to the 13 cases occurring together, the proportions are: 2, 4, 7.

As far as they go, these proportions suggest that watercress may have had to do with the origin of this group. It is, however, only a suggestion.

Various raw fruits were consumed by 47 cases, of whom only 13 were untraced. This does not disprove that raw fruit may occasionally have served as the vehicle of Enteric Fever, but the figures do not suggest that such has been the case.

Potato chips had been used by 61 of the cases, and of these by cases not traced to a previous case or to shellfish in 16 instances. Here, also, there is no suggestion of a special relation. In two of these cases it may be noted the potatoes were eaten raw.

In 14 of the above instances fried fish was used, always in association with chips.

In the same way, we find that no suggestion arises on the figures with any of the foods other than watercress. The subject appears to deserve further investigation.

#### *On the Failure to Notify Cases of Enteric Fever.*

In the course of the investigations of the cases enumerated in the history of infection, opportunities arose for observing lamentable instances of failure on the part of practitioners to notify nests of Enteric Fever which they ought not to have failed to recognise, or at least to investigate.

Last year I gave figures showing the long periods between onset of the disease and notification. This year the facts are so arranged as to show the interval between the calling in of the medical practitioner and the notification of the case. It will, I think, be generally admitted that 10 days is quite long enough in which to arrive at the diagnosis of Enteric Fever. Up to the end of the 10th day after being called in, the medical attendants sent in 205 notifications; from this up to the end of the 20th day, 61; beyond this period, 29.

It is true that in a number of these cases their attention was not pointedly directed to the case till a late period. But it is surely the duty of the medical practitioner to enquire into the possibility of other cases being present in the household besides the one he is attending.

Yet, I do not doubt that, in spite of the absence of legal procedures, the investigations of 1905 have effected much good. One is very reluctant to advise prosecutions for failure to notify. But such reluctance is, one must admit, merely weakness, if failure to notify is persisted in.

We may draw these lessons from the investigations summarised in the preceding pages.

### *Conclusions.*

1. Enteric Fever is spread in Manchester largely by failure to recognise the disease.

2. This failure is specially conspicuous in the case of children.

3. This disease has a fairly high infective capacity, especially where a number of people are gathered into one house. It is most manifest when children become attacked.

4. Medical practitioners need to be more on the alert to detect Enteric Fever in young children.

5. The value of skilled inquiry is conspicuously shown.

6. In the prevention of Enteric Fever such skilled inquiry from the Public Health Office is likely to produce the greatest amount of result at the minimum of expense.

This applies to other diseases besides Enteric Fever.

7. Shellfish play a decided part in the continuance of Enteric Fever and other diarrhoeal diseases in the City.

8. Additional powers are needed, so that information may be obtained as to the sources of infected shellfish, and so that pressure may be applied towards the purification of the supply. Mussels not properly cooked should not be used as an article of food or luxury.

9. It is probable that flies play a part in the spread of Enteric Fever in August and September.

This applies also to other diseases, and every possible means should, therefore, be adopted for the destruction of the house-fly and of its eggs, and for preventing its multiplication.

10. There is reason to think that work on polluted soil, in the warm dry season, aids the spread of the disease. Disinfection of the soil should, then, be carefully carried out.

11. Watercress is indicated as a factor, though a small one, in the continuance of Enteric Fever. The subject requires further investigation.

12. I am confident that these inquiries, utilised as they are, will materially aid in the reduction of the disease. But the staff of skilled inquirers in the Public Health Office is too small. Such results are not to be obtained by the ordinary routine methods of the Sanitary Inspector, useful as these may be.

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# MEASLES.

It will be seen from the following tables that the number of deaths from Measles in 1905 was 231. This represents a death-rate per 1,000 of 0·37, which is under the average for the five preceding years. The disease was prevalent, however, over considerable areas in each of the main divisions of the City. The highest fatality was in the Central portion of the City.

The number of elementary schools showing excessive prevalence of the disease in the different divisions gave like indications, having been for the Central Division 5, for North Manchester 9, and for South Manchester 8.

The comparative mortality from Measles and other infectious diseases is shown in the last table dealing specially with this disease. It will be seen that Measles has, next to Diarrhœa, been the most fatal of the zymotic group.

I have very fully discussed Measles in former reports, and have nothing to add for 1905.

The number of schools having over 10 per cent. of the average attendance affected with Measles or Whooping Cough at some period of the year, distributed in districts, was as follows :—

	Total	PERCENTAGE ABSENT AT ONE TIME				
		10—	20—	30—	40—	50—
Ancoats .....	...	...	...	...	...	...
Central .....	1	1	...	...	...	...
St. George's.....	4	2	1	1	...	...
Cheetham .....	3	1	1	1	...	...
Crumpsall .....	...	...	...	...	...	...
Blackley .....	1	1	...	...	...	...
Harpurhey .....	2	...	2	...	...	...
Moston .....	...	...	...	...	...	...
Newton .....	2	2	...	...	...	...
Bradford .....	1	1	...	...	...	...
Beswick .....	...	...	...	...	...	...
Clayton .....	...	...	...	...	...	...
Ardwick .....	...	...	...	...	...	...
Openshaw .....	...	...	...	...	...	...
West Gorton .....	3	2	1	...	...	...
Rusholme .....	1	1	...	...	...	1
Chorlton-upon-Medlock .....	2	1	1	...	...	...
Hulme.....	2	2	...	...	...	...
Total.....	22	14	6	2	...	...



The following are the rates of mortality for 1905, compared with the mean of the previous five years :—

1905.—MEASLES MORTALITY.—RATE PER 1000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1900	1901	1902	1903	1904	Mean	1905
England and Wales .....	0·39	0·27	0·38	0·27	0·36	0·33	0·32
*76 Great Towns .....	0·43	0·43	0·49	0·36	0·47	0·44	0·39
London .....	0·42	0·43	0·51	0·45	0·49	0·46	0·37
City of Manchester...	0·47	0·53	0·44	0·62	0·76	0·56	0·40†
Manchester Township ...	0·37	0·58	0·44	0·96	0·86	0·64	0·64
North Manchester .....	0·53	0·29	0·67	0·34	0·50	0·47	0·39
South Manchester .....	0·48	0·68	0·29	0·64	0·89	0·60	0·28†
*141 Smaller Towns .....	0·51	0·25	0·37	0·29	0·36	0·36	0·31
Rural Districts .....	0·32	0·17	0·27	0·17	0·23	0·23	0·24

\*The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns, and for 1902 and 1903 103 Smaller Towns.  
† Exclusive of Moss Side and Withington.

1905—DEATHS AND DEATH-RATES FROM MEASLES IN THE VARIOUS DIVISIONS OF THE CITY.

Statistical Divisions		Estimated Population	Deaths	Death-rate
City of Manchester .....		631,933	231	0·37
I. Manchester Township ...		129,452	83	0·64
II. North Manchester.....		182,193	71	0·39
III. South Manchester.....		320,288	77	0·24
I.	Ancoats .....	43,881	31	0·71
	Central .....	27,092	19	0·70
	St. George's .....	58,479	33	0·56
II.	Cheetham .....	40,281	5	0·12
	Crumpsall .....	9,224	1	0·11
	Blackley.....	9,445	7	0·74
	Harpurhey .....	19,886	8	0·40
	Moston .....	16,622	11	0·66
	Newton Heath .....	38,157	9	0·24
	Bradford .....	24,786	21	0·85
	Beswick .....	12,256	5	0·41
III.	Clayton .....	11,536	4	0·35
	Ardwick .....	43,715	17	0·39
	Openshaw .....	28,367	15	0·53
	Gorton (West) .....	31,126	8	0·26
	Rusholme and Kirk.....	26,021	3	0·12
	Chorlton-upon-Medlock..	56,716	14	0·25
	Hulme .....	64,756	13	0·20
	Moss Side .....	27,884	2	0·07
	Withington .....	41,703	5	0·12

The annual death-rates from Measles since 1891 at ages under 5 have been as follows :—

DEATH-RATES FROM MEASLES AND FROM ALL CAUSES  
UNDER 5 YEARS OF AGE.

		1891	1892	1893	1894	1895	1896	1897	1898
Measles	...	3·26	5·50	4·40	3·24	7·53	8·48	9·35	4·02
All causes	...	86·6	78·7	86·3	66·5	90·7	80·4	85·3	78·1

		1899	1900	1901	1902	1903	1904	1905	
Measles	...	10·31	3·66	4·29	3·51	5·13	6·24	3·10	...
All causes	...	87·5	78·3	74·5	64·7	69·5	75·8	59·2	...

Recent history     It will be seen that a severe outburst began in 1895, and lasted for five years.

Comparison of  
mortality with  
that from  
other  
infectious  
diseases

A comparison of the mortality due to Measles with that caused by other zymotic diseases, and with Phthisis, is given in the following figures :—

No. of Deaths from        }	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905
Measles .....	220	369	293	222	505	567	628	271	699	254	292	242	345	425	231
Scarlet Fever...	114	130	140	116	173	198	124	65	46	105	127	146	97	85	78
Diphtheria .....	122	91	122	102	72	54	29	41	71	76	133	123	136	99	127
Enteric Fever...	189	124	127	91	95	118	95	120	73	75	75	66	93	66	55
Smallpox.....	0	2	49	21	2	0	0	0	0	0	0	0	24	9	0
Whooping Cough..... }	518	368	240	286	250	359	299	170	227	371	224	242	213	280	195
Diarrhœa, &c. .	432	418	956	375	904	572	964	1090	1121	822	1019	296	507	761	729
Phthisis .....	1117	1053	1060	1026	1139	1078	1139	1056	1117	1135	1144	1145	1025	1106	988

We thus see how greatly the mortality from Measles exceeds that from Scarlet Fever, Diphtheria, or Enteric Fever.

In 1897 and 1899 the deaths from Measles exceeded in number those from all these fevers, with Whooping Cough added

## WHOOPIING COUGH

Is, after Measles, the most fatal disease of childhood.

Both these diseases are very liable to be followed by Phthisis, a fact which much increases their importance, and reminds us that in failing to arrest their extension we are also failing, to some extent, to deal with the more formidable disease. The mortality from Whooping Cough in 1905 was below the mean for five years. Yet the number of deaths was 195. These were distributed all over the City.

The tables relating to this disease show the death-rate in Manchester for 1905 and for the preceding five years; in 1905 it exceeded the death-rate for England and Wales by 0·09 per 1,000 living.

The rates giving the Whooping Cough mortality for 1905 are as follows:—

1905.—WHOOPIING COUGH MORTALITY.—RATE PER 1000 LIVING, COMPARED  
WITH MEAN OF FIVE YEARS.

	1900	1901	1902	1903	1904	Mean	1905
England and Wales .....	0·34	0·30	0·29	0·27	0·34	<b>0·31</b>	0·25
*76 Great Towns .....	0·45	0·36	0·37	0·33	0·40	<b>0·38</b>	0·29
London .....	0·43	0·35	0·40	0·35	0·33	<b>0·37</b>	0·32
<b>City of Manchester...</b>	0·68	0·41	0·44	0·38	0·50	<b>0·48</b>	0·34†
Manchester Township ...	0·79	0·41	0·55	0·25	0·70	<b>0·54</b>	0·30
North Manchester .....	0·66	0·48	0·42	0·24	0·47	<b>0·45</b>	0·27
South Manchester.....	0·64	0·36	0·39	0·55	0·42	<b>0·47</b>	0·40†
*141 Smaller Towns.....	0·34	0·30	0·22	0·28	0·35	<b>0·30</b>	0·23
Rural Districts .....	0·27	0·25	0·22	0·22	0·27	<b>0·25</b>	0·20

\* The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns, and for 1902 and 1903 103 Smaller Towns.

† Exclusive of Moss Side and Withington.



The following table shows the districts most affected:—

1905.—DEATHS AND DEATH-RATES FROM WHOOPING COUGH IN THE  
VARIOUS DIVISIONS OF THE CITY.

Statistical Divisions	Estimated Population	Deaths	Death-rates
City of Manchester.....	631,933	195	0·31
I. Manchester Township.....	129,452	39	0·30
II. North Manchester .....	182,193	50	0·27
III. South Manchester .....	320,288	106	0·33
I. { Ancoats .....	43,881	12	0·27
Central... ..	27,092	12	0·44
St. George's.....	58,479	15	0·26
II. { Cheetham .....	40,281	7	0·17
Crumpsall .....	9,224	2	0·22
Blackley .....	9,445	2	0·21
Harpurhey .....	19,886	11	0·55
Moston .....	16,622	2	0·12
Newton Heath .....	38,157	5	0·13
Bradford .....	24,786	14	0·56
Beswick .....	12,256	3	0·24
Clayton .....	11,536	4	0·35
III. { Ardwick .....	43,715	12	0·27
Openshaw .....	28,367	15	0·53
Gorton (West).....	31,126	8	0·26
Rusholme and Kirk. ....	26,021	11	0·42
Chorlton-upon-Medlock.....	56,716	20	0·35
Hulme.....	64,756	34	0·53
Moss Side .....	27,884	3	0·11
Withington .....	41,703	3	0·07

## SUMMER DIARRHŒA.

The following tables show the distribution of fatal Diarrhœa in periods of the year and in sanitary districts. They also permit of a comparison with other towns, and with the country generally. The meteorological data which stand in relation with Diarrhœa are given :—

1905.

### DEATHS FROM DIARRHŒAL DISEASES IN MANCHESTER IN THE WEEKS ENDING ON THE DATES GIVEN BELOW.

FIRST QUARTER			SECOND QUARTER			THIRD QUARTER			FOURTH QUARTER		
Jan.	7	2	April	8	1	July	8	7	Oct.	7	10
"	14	5	"	15	1	"	15	7	"	14	9
"	21	3	"	22	3	"	22	22	"	21	5
"	28	3	"	29	...	"	29	62	"	28	4
Feb.	4	...	May	6	6	Aug.	5	81	Nov.	4	6
"	11	...	"	13	1	"	12	89	"	11	3
"	18	...	"	20	1	"	19	67	"	18	3
"	25	1	"	27	1	"	26	81	"	25	2
Mar.	4	1	June	3	...	Sept.	2	61	Dec.	2	3
"	11	2	"	10	4	"	9	61	"	9	5
"	18	2	"	17	5	"	16	42	"	16	4
"	25	1	"	24	4	"	23	20	"	23	1
April	1	3	July	1	4	"	30	15	"	30	5
Total...	23		Total...	31		Total ...	615		Total ...	60	

City Total . . . . . 729

In this year the incidence falls sharply on the third quarter. It will be noted that the fatal cases having attained their maximum in the week ending August 12th, reach a second maximum in the week ending August 26th. There is no evident reason for this.

As usual, the highest death-rates are in the Central districts. It is very noticeable that, while the death-rate for 1905 falls decidedly below the average for 10 years, in each of the Central districts and in most of the Northern districts it is above the average. The reverse is the case with the districts in South Manchester.

It must be admitted that this is a very remarkable circumstance, and one the explanation of which might carry with it other important explanations. It can scarcely be that any meteorological or telluric differences have established themselves.





I know of no reason to believe that the teaching of poor mothers has taken a firmer hold on South than on North Manchester.

There is no reform in the milk supply on one side more than on the other. The excess on the North Side, moreover, does not extend to every district.

In 1904, again, Hulme and Ardwick are in excess of the average.

If we run our eyes along the horizontal lines, we see that the individual districts fluctuate greatly from year to year, the fluctuations being very large for outlying districts, such as Moston and Blackley.

Further, in 1900 it is the Northern districts which fall below the mean, while the Southern districts are in excess.

We must conclude that the causes are such as are in their own nature subject to change, such as the number of pre-existing centres before the autumnal rise, or the numbers of house-flies generated in the respective districts, or some other local causes.

The number of deaths in quarters are as follows :—

#### DIARRHŒA AND SIMPLE CHOLERA DEATHS IN QUARTERS 1895-1905.

	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	Mean for 10 years	1905
First Quarter.....	51	37	49	55	46	41	45	33	48	34	44	23
Second Quarter...	59	78	50	49	53	66	32	33	49	38	51	31
Third Quarter.....	574	391	803	807	948	562	865	120	303	626	600	615
Fourth Quarter...	220	66	62	179	74	153	74	110	107	63	111	60
	904	572	964	1090	1121	822	1016	296	507	761	806	729

Here, again, striking differences present themselves in the quarterly distribution of deaths, dependent mainly on different distributions of temperature. What is strikingly evident, however, is that, so far as deaths show, the number of infective centres present at the beginning of the third quarter does not vary much from one year to another, and bears no relation to the subsequent outburst.

It can scarcely be on the number of such centres that the variations in the number of cases in districts depends, except, perhaps, in thinly populated outlying areas. The circumstances regulating the conveyance of infection will, most likely, determine the variations noted.

By means of the following figures we are enabled to compare the fatality from Diarrhœa and Simple Cholera in Manchester with that prevailing in other parts of the country, and it will be seen that Manchester occupies its usual position relative to other towns, being, however, relatively worse in 1905 than in the five years 1900-1904.

1905.—DIARRHŒA AND SIMPLE CHOLERA MORTALITY.—RATE PER 1,000 LIVING, COMPARED WITH MEAN OF FIVE YEARS.

	1900	1901	1902	1903	1904	Mean	1905
England and Wales .....	0·69	0·91	0·38	0·50	0·86	0·67	0·59
*76 Great Towns.....	0·94	1·23	0·54	0·71	1·20	0·92	0·83
London .. .....	0·78	0·87	0·54	0·64	1·04	0·77	0·73
<b>City of Manchester</b> .....	1·52	1·86	0·54	0·91	1·36	1·24	1·15
Manchester Township .....	2·12	2·72	0·73	1·41	1·86	1·77	2·09
North Manchester .....	1·10	1·61	0·44	0·64	1·16	0·99	1·14
South Manchester .....	1·45	1·56	0·50	0·84	1·25	1·12	0·79
*141 Smaller Towns† .....	0·81	1·09	0·35	0·43	1·90	0·72	0·57
Rural Districts .....	0·48	0·65	0·22	0·31	0·46	0·42	0·32

\* The rates for 1901 and previous years are for the 33 Great Towns and 67 Smaller Towns. † The rates for 1902-3 are for 103 Smaller Towns.

The following table supplies meteorological data for the third quarter of the year, the season in which the disease is most prevalent:—

Third Quarter of the years	Mean Temperature	Rainfall, Inches	Humidity, per cent.	Diarrhœa and Simple Cholera Mortality. Annual Rate per 1,000 living
1888	56°·5	11·2	77 %	1·36
1889	57°·7	10·5	73 %	2·61
1890	58°·8	8·1	74 %	2·28
1891	58°·2	12·8	79 %	1·57
1892	57°·0	12·5	78 %	2·07
1893	60°·4	10·7	74 %	4·95
1894	57°·8	9·0	78 %	1·55
1895	60°·4	11·2	77 %	4·17
1896	58°·5	9·7	76 %	2·93
1897	58°·9	9·7	73 %	6·01
1898	60°·1	6·1	74 %	6·00
1899	60°·8	7·7	75 %	6·96
1900	60°·3	9·6	78 %	4·14
1901	61°·9	6·5	74 %	6·33
1902	57°·6	5·9	78 %	0·88
1903	57°·8	12·3	77 %	2·19
1904	60°·2	6·9	73 %	4·48
<b>Mean</b>	<b>59°·0</b>	<b>9·4</b>	<b>76 %</b>	<b>3·56</b>
1905	58°·9	9·4	76 %	3·89



The death-rates both in the third quarter and for the whole year in 1905 closely approximate to the mean of the preceding ten years. Still, it may be said that in 1902 to 1905 there has been a lull in the diarrhoeal mortality, separated by a period of 7 years from a preceding lull of similar magnitude.

It is to be feared that we have not made any improvements which will suffice to avert the increase which is likely again to set in. A mean temperature, almost equal to that in the third quarter of 1905 held in the third quarter of 1897, yet the diarrhoeal death-rate was widely different. In 1890 again it was lower, though the rainfall was less than in either. It is not alone mean temperature, but the distribution of temperature which has to be considered. The magnitude of the effects produced would seem to depend, also, on the original magnitude of other causes, themselves subject to the action of high temperature.

In his classical work on "Diarrhoea," Dr. Ballard arrived at the following conclusions. Summer Diarrhoea is a pathological entity just as Scarlet Fever or Enteric Fever is. It is present at all seasons in considerable amount, but attains epidemic proportions in the third quarter of the year. Previous conditions of ill-health have a powerful effect in the causation of fatal Diarrhoea. Breast-fed infants suffer considerably less than do those fed by hand.

In his opinion, atmospheric temperature is not in close causative relation with the disease, while the temperature of the soil is, and he was thus led to the theoretical conclusion that the hypothetical germ causing Diarrhoea grows in the soil and finds its way to the surface. Thence it arrives in some way at the infant's food. He was thus led to attach great importance to soil, and believed that he was in a position to say what soils were favourable and what unfavourable to prevalence of the disease.

Conditions of filth about dwellings, overcrowding, want of ventilation; and deficiency of light he considered to be important causes, the more so that local authorities could do much in the way of removing them.

Rainfall he believes to exert only an indirect effect in so far as it modifies the temperature of the soil.

Owing to the non-discovery of a specific bacillus in the affected organism, and, also, influenced by the extremely abrupt onset of many cases, Dr. Klein at that period—before 1887—attributed the phenomena of the disease to chemical products manufactured by the hypothetical organisms in food, whether without or within the body.



The most prominent symptoms of the disease, other than Diarrhœa, are vomiting and convulsions. The latter, mainly as the result of Dr. Klein's examination of kidneys from fatal cases, he attributes to renal disease. Catarrh of the lung was a frequent complication of cases carefully observed.

A careful study of his data, it seems to me, leads to the conclusions at which he arrived—in the main. In former reports, however, I have given reasons for thinking that atmospheric temperatures does, in fact, stand in close relation with prevalence of Diarrhœa, and that the factors producing its extension lie more on the surface than Dr. Ballard supposed.

It is true, if one place be compared with another, the amount of fatal Diarrhœa does not stand in close relation with atmospheric temperature. But we are not to suppose that atmospheric temperature acts by predisposing the human frame to the development of Diarrhœa, and that the infective matter is everywhere present in equal amounts.

High temperature must, in the main, act indirectly by its effect on the growth of pre-existing foci of infection, or by favouring in some way the transmission of infection, though its exhausting effect is not entirely to be lost sight of.

Hence the abundance of these foci, or of the conditions favourable to transmission, will determine largely what effect the mean temperature is able to produce

It is, I think, by following the effects of a higher temperature in one and the same place that we must determine whether the reaction to temperature is immediate or remote.

The intimate relation between the height of the curve of fatal Diarrhœa on the one hand and the indications of the four-foot earth thermometer on the other probably arises, in large measure, from the circumstance that these indications integrate the effects of the surface waves of heat.

This may not be so entirely. Dr. Ballard believes that he has found porous soils, and more especially made ground, to be most favourable to the prevalence of fatal Diarrhœa, and this observation requires reflection.

Then, again, there seems to be little or no room for doubt that Summer Diarrhœa is caused by a specific micro-organism or group of micro-organisms. In his report he gives an investigation by Dr. Bruce Low of an outbreak of Diarrhœa, the cases in which were completely linked together in series. The not infrequent spread of Diarrhœa in institutions points in the direction of infection from person to person, doubtless, chiefly, by means of food. In my Annual Report of 1904, I gave an account of over 100 cases carefully

investigated, in which direct infection bore an important part. Were it possible for a careful and experienced enquirer to give the necessary time, I make no doubt that he would be able, in most cases, to establish a similar or more extensive history of direct exposure to infection.

Chiefly on this ground, but also having regard to bacteriological inquiries, we must regard the infective process as being due to a multiplication within the system of specific micro-organisms which play a similar role to those of Cholera or Enteric Fever.

I have, therefore, had another series of 102 cases, of whom 100 were children, investigated carefully by Mr. Hewitt. There are lacunæ in the inquiry, which it will be possible, I hope, to fill in, in the course of another year. But these enquiries enable us to review the conclusions towards which one was conducted in the previous series.

#### *Summer Diarrhœa a Specific Disease.*

A statement has been made in respect of each case, for which the mother's observations could be obtained, of the signs of illness which she noted. The histories thus obtained are remarkably good, considering their source.

From these histories we gather that in seven instances it was possible to suspect that the illness might have been Enteric Fever. In only one instance, however, does the evidence warrant a strong suspicion.

With tubercle it is otherwise. It is, however, very difficult to say what part tuberculosis played in the fatal result, except that a tuberculous affection of the bowels strongly predisposes to Summer Diarrhœa. We may classify the cases thus :—

Child had tuberculous bowel of a severe type, and the Diarrhœa was probably merely an exacerbation of the previous illness—7 cases.

The fatal affection was possibly Tuberculosis in 4 cases.

In 8 instances the infant probably suffered from Tuberculosis, though the final illness was Diarrhœa.

In 16 instances there was a Tuberculous history, and a suspicion of Tuberculosis in the child, though the end was brought about by Diarrhœa.

In 35 instances, therefore, Tuberculosis had to be considered. In two instances, (78 and 103), the affection was, certainly, simply Tuberculosis.

In the case of 84 it is possible that the infant suffered from Broncho-Pneumonia, and not from Diarrhœa.



It is thus possible that in a small proportion of the cases the disease from which the child died was not Summer Diarrhœa, but the following analysis will not be thereby affected.

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The accounts of the illness in individual cases will be illustrated by the following :—

Case 1, f. æt. 13 months. Took ill June 16th. Died June 18th. Breast-fed 5 months. Hand-fed 8 months. Child had always a poor appetite. Wailed continuously from birth to the age of 5 months. Dr. R. came to vaccinate, but declined, as the infant was rickety, and instructed the mother to wean. After this age it was under medical advice to death, on and off, and remained rickety. On June 11th it took ill suddenly with vomiting, followed by loose motions, watery, and not green; cried piteously; kicked its legs up and down. June 18th, swayed its head; everything ran through it. Death.

Case 2, m. æt. 3 months. Took ill June 17th. Died July 13th. Onset on June 17th. Vomiting and Diarrhœa. Motions green and slimy, feverish, swayed its head, eyes were turned up and rolled about. There were lumps behind the ears, from which there was a mattery discharge. There was slight cough. 23rd, child taken to doctor.

*Second week*—It lay still and quiet, moved its fingers, drew the legs up. The belly was hard, not swollen, and soft alternately.

*Third week*—Gradually wasted to a skeleton. Had ulcerated mouth and tongue throughout the illness, and sweated terribly.

Case 3, f. æt. 5 months. Began to be ill about June 20th. Died July 24th. Strong tuberculous history. About June 20th emitted a constant cry, vomited, had loose and slimy motions, discharged quantities of saliva, had white tongue. Belly swollen on alternate days. Forehead burned hot. It got better for a few days and then recommenced. July 17th to 24th, forehead burned hot, profuse sweat, the infant lay still. On July 23rd it had “inward convulsions.” There was slight cough all through the illness, and the child went to a skeleton.

These cases will serve as illustrations of the histories obtained. They are, of course, meagre, and wanting in points which a medical attendant would note, but are not without value.

They are, in general, remarkably alike, and the main features are those on which Dr. Ballard laid stress. The impression produced is that of a distinct disease.



From these histories we gather that the 100 children had Diarrhœa in 98 instances ; in 17 the motions were not specified, or were of the usual colour ; in 54 they were green, in 21 they were watery, in 4 they were bloody, in 2 black. In 2 cases there was no Diarrhœa. It should be stated that sometimes the motions began by being copious and watery, and subsequently became green. In that case they are put under the term " green."

In 74 instances there was vomiting, which commenced early in 63 cases, and late in 11.

In 71 instances there was convulsions, which came on early in the case in 11, and late in 60 instances.

In 13 instances the child had a cough. In 13 instances, also, the tongue was stated to have been ulcerated.

Discharge from the ears occurred in 7 instances ; from the eyes in 3.

In 2 cases the body went black, and in 1 the tongue was black.

These are the chief complications observed by the mothers.

The cases may be exhibited as follows in respect of their ages, and the duration of their illnesses.

*Duration of illnesses in days.*

Ages in Months	-7	-14	-21	-28	+28	Total
0--	12	8	0	3	3	26
4--	14	4	3	0	4	25
7--	10	4	1	0	2	17
10--	5	3	3	1	1	13
12--	5	5	1	0	1	12
18+	4	1	0	1	1	7
						<u>100</u>

In 11 of these the final attack was only the exacerbation of a similar pre-existing illness of long duration. Relapses occurred in cases 11, 22, 64, 74, similar to those which occur in Enteric Fever.

The observations which I purpose to make are based on the above cases, with the corresponding series analysed last year.

First, then, my facts are in entire agreement with Dr. Ballard's statement that *the previous state of health of the child is a potent factor in the production of the fatal attack*, and agree with the facts given in the Annual Report for 1904.

These facts may be analysed as follows :—

*History of Children as regards their previous state of Health.*

Excluding two cases not specially investigated, the children numbered 98, of whom 60 had bad health prior to the onset of Diarrhœa.

Of the remaining 38, 21 are recorded as having had good health, numbered in the series 14, 19, 22, 25, 26, 35, 36, 44, 50, 57, 60, 61, 63, 65, 66, 71, 73, 76, 79, 83, 85. Considering that these children were said to thrive, some of them, viz., 63, 73, and 74, had surprising diets for infants.

The following points are also noteworthy. Cases 14, 19, 26, 36, 73, 79, and 83 breathed entirely by the mouth.

Case 22 was having lime water, dill water, and Pritchard's teething powders, which appears to show disturbed digestion.

Here one may remark that teething often produces considerable constitutional disturbance, and must not be underrated as predisposing to infection.

Case 25 was having brandy and Fenning's powders. It was taken off the breast at 5 months. The feeding was injudicious, was attended with sickness, and almost immediately was followed by the attack.

Case 26 was 8 months old at death. At this age he began to have bread dipped in gravy, which disagreed with him, and may have laid him open to attack.

Case 35 died at 9 months. At two months he had a nasty cough. His mother is thin and weak-looking, and has lost 3 children—2 with Phthisis, 1 with Pneumonia.

Case 36. Feeding from 3 to 5 months' very bad; must have disagreed. Died at 6 months.

Case 73, m. æt. 11 months. When 3 months old had Bronchitis for 6 weeks. Feeding bad.

Case 79 suffered from teething; had Fenning's powders.

Thus 10 out of the 21 were probably not enjoying regular good health.

I have put down 13 cases as enjoying fair health, viz. :—12, 17, 27, 28, 47, 62, 74, 77, 87, 92, 94, 95, 96. Full information was not available for case 12, the family having migrated to Liverpool, but the mother had previously lost 8 children.

The following facts relate to these 13 cases :—

Case 17 breathes entirely by the mouth. Parents appear old for their age. Mother untidy ; father weakly ; both take beer. They have lost 4 infants—2 from Diarrhœa, 2 from convulsions.

Case 27. There has been trouble with the bowels.

Case 28. Died at 10 days ; swollen navel.

Case 43. Grandmother, who is nurse, says the child's health has been good ; but she is intemperate and dirty. The mother is thin. The child is illegitimate.

Case 47. Feeding injudicious and insufficient.

Case 62. Died at age of 11 months. After 6 months the feeding was bad ; the infant picked up bits from the passage. It was often costive. Fenning's powders and rhubarb were given. There is a tuberculous history in the family.

Case 74. Child often constipated. Feeding most unsuitable.

Case 77. Bowels always gave trouble, costive.

Case 87. Bowels loose and costive by turns before the attack.

Case 92. Breathed entirely by the mouth, and suffered from teething. The feeding after the age of 6 months was bad.

Case 94. Had Bronchitis, following Measles, in 1904.

Case 95. This infant was taken off the breast at 4 months, and put on condensed milk, which did not agree. The infant often vomited. It was attacked, and died at 5 months.

Case 96. Died at 10 months. Up to 9 months it throve, then began to have bits from the table, and was often sick.

It is very doubtful whether any of these 13 infants had the fair health with which they are credited. It would appear that what failure existed in the 38 children to reach the standard of good health was largely due to bad feeding.

In addition there are 4 cases, viz. : 15, 18, 43, and 70, in which satisfactory information could not be obtained by the enquirer.

The facts, then, may be thus summarised :

Of 102 cases, 2 old persons and 2 children in one house are excluded, the last as not having been specially investigated.

Of the remaining 98 cases there were 4 in whom the previous health could not be satisfactorily gathered from the informant. This leaves 94 cases, who may be classified thus :—

Previous health bad, 60. Previous health possibly good, 21. Previous health fair only, or doubtful, 13.



We shall probably not be far wrong in assuming that 75 per cent. had bad health prior to the attack.

*Causes of bad health prior to the attack.*

To what, now, must we ascribe this condition of previous bad health in so many of the children? As we shall see, they are assailed by injurious conditions from many directions. Do these act through the food, or by impurities inhaled? So far as the food is concerned, we are in a position to give some answer, as Mr. Hewitt has elicited a full account of the feeding pursued from birth to death in nearly all the cases investigated, with the observed effects upon the nutrition of the child.

This account does not lend itself easily to analysis, and loses much of its value in the process, but it would be impossible to present the facts in any other shape.

One thing impresses one very much, viz., the immense pains and expense incurred by many poor mothers in trying to save their children. Five out of 98 children were breast-fed entirely up to the time of their attack.

Twenty-five were partly breast-fed during the whole or part of the antecedent period, the breast being shared in 8 instances with cow's milk, in 3 with Nestle's sweetened condensed milk, in 1 with both, in 13 instances with other foods. In one instance the breast was preceded by the use of cow's milk.

Fifty-nine had cow's milk—in 43 instances alone, in 7 instances with Nestle's, in 8 with breast milk.

Seventeen had Nestle's milk alone.

One had other food

Of the 98, 51 were already having starchy foods prior to the age of 6 months, such as bread, patent food, biscuits, rusks, etc., of whom 5 were having bits of anything at the table. This was the case with 22 prior to the age of 9 months. These bits include tea, pork, potatoes, puddings, bacon, and so forth.

On a careful consideration of the diets, I conclude that 22 were receiving insufficient food. In 10 instances an opinion could not be formed. In 2 instances the infants were overfed. One child had eaten haws picked off the street.

As regards the cooking of the food before use, in only 10 instances may we assume that the cow's milk was not boiled. The condensed milks are never boiled. We may assume that something like 13 children were having milk which had not been boiled. There is necessarily some uncertainty on this point.

As regards the protection of the infants' food, we find that the cow's milk or condensed milk stood uncovered on the table, slopstone, or scullery shelf, exposed to flies and dust, in 68 instances. On one occasion it was placed in the oven, and on another on the hob. In five instances it was noted that the sugar was not covered, although the milk was. In the majority of cases cow's milk is boiled on arrival, but much of the benefit is destroyed by exposure of the milk, after boiling, often to gross contamination.

The enquiry into whether the child throve on the various foods which it received brings out results agreeing with those already arrived at. Of the children who were markedly ailing prior to attack, there are two groups which attract our attention. One is the group ailing from birth, numbering 28.

A second group begins to suffer acutely on being hand-fed, usually immediately or shortly after. This group numbers 26. In the former group the bad health may or may not precede the hand-feeding. Of the above 28, 9 were hand-fed from birth.

We may say, therefore, that in this series there are two groups, not very unequal, in one of which the feeble health is inherited, or is not due to artificial feeding, in the first instance at all events; in the other it is due to the food which the child gets, and which keeps the bowels in a constant state of irritation.

Much of the bad health is avoidable, and is due to carelessness on the part of the mother or nurse. Carelessness was observed in 38 instances.

As regards the appliances used in infant feeding, there is manifest a tendency to lesser use of the long tube. 35 children had the long tube, 31 the bottle advised by the Health Office, and 22 the cup and spoon. It is probable that the effect of defective appliances is greater in their interference with nutrition than in their liability to convey infection; yet the long tube may act in both ways.

The group "ailing from birth" seems to deserve special consideration. I have, therefore, excerpted the cases in which an affection of the bowels suggestive of an early diarrhoeal condition occurred. These cases might either be chronic, or the fatal attack might have been due to infection of a different kind. Or, again, the earlier illness might have belonged to an entirely different disease.

Case 5, m. æt.  $11\frac{3}{4}$  months. Weaned at 3 months. At the age of 6 weeks vomited, and everything ran through him. There was partial recovery from this attack, and the final illness may have been a second one.

Case 7, m. æt.  $2\frac{3}{4}$  months. Weaned at 1 week. Food ran through him from birth.



Case 9, m. æt. 2 months. Weaned at 2 weeks. From birth was sick, and had copious green Diarrhœa. Mother was ill at the same time; her illness lasted 5 weeks, and suggests Enteric Fever.

Case 10, f. æt. 5 months. Weaned at 5 weeks. Motions loose, and green from birth. Striking phthisical history. Child wasted to a bone before death. (?) Tuberculosis.

Child 13, f. æt. 7 months. Weaned at 11 weeks. Vomited from birth, and had green motions, not specially loose. Two previous stillborn children.

Case 41, m. æt. 8 months. Weaned at 13 months. Had loose bowels, as had twin child, from birth; worse after weaning. The twin died of Consumption of the Bowels. There is a man living in this house who suffers from Phthisis. (?) Tubercle.

Case 64, m. æt. 9 months. Hand-fed always. Birth to 1 month vomited, was griped, had green motions, belly swollen, had fits, never put on flesh.

Case 75, m. æt. 23 days. Hand-fed from birth. Motions always green, watery, and very loose.

The two conditions which appear to stand out here are :—

1. The effect of entirely different diseases in producing a chronic Diarrhœal condition.
2. The marked influence of hand-feeding. This last is, of course, much more strongly brought out by the second group of cases, in which illness, often with Diarrhœa, sets in directly after weaning.

It is probable that these intermittent Diarrhœas which occur in the course of hand-feeding are due to toxic materials produced in the milk in some instances, although they are probably also frequently caused by mechanical irritation due to particles of unsuitable food. The chronic derangement of the bowel thus brought about is highly favourable to the action of specific infective matter.

*Influence of previous bad health in favouring infection.*

48 out of the 100 cases come into relation with previous attacks. Supposing a child healthy to start with, we should expect that a larger dose of infection would be necessary to cause a fatal attack than if he were weakly, and we might therefore expect that out of the 21 cases entered as having previous good health, there would be a larger proportion than 48 per cent. in relation with previous known sources. We find, in fact, that this is the case with 15 out of the 21.



The exceptions are 14, 19, 22, 25, 26, and 49.

The circumstances attaching to these cases should, therefore, be interesting.

(14), m. æt. 7 weeks. Took ill July 10th. Died July 14th. He breathed by the mouth. About 2-30 p.m. on July 10th his mother and the baby were standing close to a sough which the Sanitary Inspector was plunging to remove a stoppage existing since February. A very foul smell was given off. Four hours after, the baby was seized with its fatal attack of Diarrhœa.

(19)—The observer notes: "I had difficulty in obtaining the information, both parents holding back." M. æt. 9 months. Taken ill July 13th. Died August 19th. Other cases have occurred in this street. A tremendous number of flies during the child's illness. The wall paper is spotted with fly-dirt. The hearthrug and living room floor are dirty. (Very likely the infant was placed on this hearthrug). The infant was fed on "handy brand" condensed milk, unboiled, which stood uncovered. Infection was probably fly-borne.

(22)—Child breathed by mouth. Mother has provision shop, and would probably not have time to look after the child. The closets are pails adjoining the houses. There is no yard. The kitchen door opens direct on a filthy back passage, which smells badly. Food is kept over this door, and gets speckled with dust and dirt. Drains in cellar bad. Food, Nestle's condensed milk, kept on living-room table uncovered. Mother has very dirty long finger nails, and rubbed the infant's gums with her fingers. Flies present in medium number. Here the infection was probably conveyed direct to the food in blown dust.

(25), f. æt. 5 months. See previous note on this case. This infant was fed on Nestle's condensed milk, used unboiled, kept uncovered. Flies were numerous. The privy is a pail-closet adjoining the house, of which the floor is sunk and wet. The house is badly lighted. The yard is very small. There is a foul smell in the yard coming from foul drains and loose flags. Mother used to place the baby here in her perambulator.

(26), m. æt. 8 months. See previous note. Fed for 4 months on cow's milk, and dips of bread in gravy. Milk is kept covered. Sugar is uncovered. There is here a tremendous number of flies, although the house is very clean. The closet is a pail adjoining the house. The yard is small. In the passage behind is a stopped offensive drain. The cellar surface is bad and dirty. Infection probably-fly borne.

(49), m. æt. 5 weeks. Took ill July 28th. Died August 4th. Father a scavenger, and works amongst pail-closets. His clothes are very dirty. He says he often nursed the baby. The mother is weak in health and very untidy. The house is not clean. There is a tremendous number of flies here. The

yard is very small. The closet is a pail adjoining the house. It was overflowing at visit. Milk jug probably contaminated by father's hands. The baby breathed through the mouth.

*Breast-milk a safeguard against infection and against a fatal issue.*

It is a well-recognised fact that *breast-fed children suffer very slightly from fatal Diarrhœa as compared with hand-fed children.*

The proportionate fatality from Diarrhœa of breast-fed and hand-fed infants has been variously estimated. Dr. Hope made a personal investigation of the feeding of a large number of infants, with the aid of which he estimated that Summer Diarrhœa is 15 times as fatal to infants under 3 months of age as to breast-fed infants at the same age. I endeavoured in 1897 to arrive at an estimate in another manner. Taking 1,000 and 600 children under two years of age, their mode of feeding up to 12 months was ascertained, and a table was constructed for each set, giving the total months of age lived under breast feeding, partial breast feeding, and entire hand feeding respectively. Assuming that these figures could be taken to represent the relative numbers of children living at those ages, the chances of dying from Summer Diarrhœa at the respective ages could then be easily calculated. The weakness of the method lies in the assumption that the months of life lived could be taken as equivalent to the number of children being fed in the respective manners at those ages.

The results are, however, of some interest. They give chances against a hand-fed child far greater than Dr. Hope's figures indicate. The reason of this is that the children are, in reality, no fair sample, so many hand-fed children having dropped out. It is true dead children were taken into account, when these had occurred in the family visited. But this could not fill in the gap. The difference is much greater than would be accounted for by deaths from Diarrhœa, and we must infer that hand-fed children die off at a much greater rate than breast-fed children from other causes than Diarrhœa.

Moreover, the consideration of the results appears to show that even Dr. Hope's investigation was not large enough to give a stable figure.

To estimate aright the mortality arising from artificial feeding we should have to make investigations covering many thousands of infants made at different seasons.

Meantime, accepting Dr. Hope's estimate, we perceive that it is of the utmost importance that mothers should suckle their infants.

Taking the 100 cases investigated, we find that of these 82 were under 12 months of age; of whom 5 were breast-fed entirely at the time of attack, 11 were partially breast-fed, and 64 were entirely hand-fed. Doubts were felt



as regards the information given in 1 out of the 5 cases, and in 3 out of the 64 cases entirely hand-fed, the infants aged 8 months, 11 months, and 6 months respectively had been ill from birth with an illness which passed by insensible gradation into the final scarcely more acute condition.

No fewer than 28 were ill from birth.

It is important to observe that a certain proportion of breast-fed children are attacked. We may infer from the above facts and from similar facts, given by others, and in previous Manchester reports, that *infection is introduced into the system largely in the artificial food of the infant*. We are not at liberty to infer, however, that the great disparity between the fatality of Summer Diarrhœa in breast-fed and hand-fed infants is due merely to their relative exposure to infection. We have seen that 75 per cent. of these 100 children did not enjoy good health prior to their attack, and the amount of infection required to produce a fatal attack in a weakly child must be inferred to be much less than what is needed to produce a fatal attack in a healthy child. It scarcely requires statement that the breast-fed child is, on the average, much healthier than the hand-fed child. When we draw attention, therefore, to the fact that *breast-fed infants* are attacked by *fatal* Diarrhœa in a certain proportion of cases, say 1 in 15, we may infer that *they are exposed to infection, and even suffer from non-fatal attacks in a higher proportion than these figures indicate*.

This consideration affects the prevalence of Diarrhœa, but does not diminish the importance to be attached to hand feeding, since it is clear that the enfeebling influence of such hand feeding must raise the death-rate amongst artificially-fed children from many causes besides Diarrhœa.

In a previous section attention has been drawn to the very great influence of the previous state of health of the infant, and it is, therefore, interesting to note the condition of the breast-fed infants prior to their attack. The whole five were feeble, except one. This one suffered from "frog" prior to its attack, and was, moreover, exposed to infection from a previous case. If, then, breast-fed children are exposed to infection, and even suffer from attack in no inconsiderable numbers, there must be some sources of infection other than their food. To these other sources of infection we shall come presently.

#### *Why mothers do not suckle their infants.*

Meantime we may consider whether, if fatal Diarrhœa is so intimately associated with hand feeding, more cannot be done to induce mothers to suckle their offspring. On a consideration of the cases specially investigated in 1904, we were led to the conclusion that, with very rare exceptions, *mothers do suckle their infants, whenever they can, in Manchester*. I have again analysed the facts for 1905, and the same conclusion is reached. There is doubtless much ignorance



and dirt, and some debasement. But the maternal instincts are allowed full play, and little improvement here is to be looked for. Such improvement as we can attain will be in the more careful feeding and regulation of habit of the pregnant mother, so that she may be helped to suckle her infant, and can only be gradual.

The reasons why 78 children were weaned, as given by the mothers, may be classified as follows :—

	No. of instances.
Mother died .. .. .	1
Mother seriously ill .. .. .	11
No milk, or milk failed.. .. .	33
Abscess of breast .. .. .	6
Nipples retracted .. .. .	3
Milk disagreed .. .. .	4
Child refused, or too weak to take breast.. .. .	4
Child ill .. .. .	1
Instructions of Medical Attendant on account of illness in mother or child .. .. .	7
Child illegitimate .. .. .	1
Cleft palate .. .. .	1
Mother had to go out to work .. .. .	5
Weaned because she thought she had suckled long enough (5 months) .. .. .	1
	—
	78

It may be supposed that though the mothers do not fail to suckle their children in Manchester, and do, it may be added, consider it a reproach not to give the breast when they can, they may yet not give them the personal care which others cannot be relied upon to bestow. I have, therefore, looked up the person attending on each of the 100 children, and find that in 70 instances this was the mother; in 22 instances the child was nursed partly by the mother and partly by another person, while in 8 instances only was the child entirely nursed by another person.

How great is the desire of the mother to attend to her child may be seen from the analysis of the reasons why the mother has not tended it. In one the mother was dead; in 2 she was too ill to nurse the child; in 4 the child was illegitimate, and the mother had to go out to work; in one only is work given as the sole reason.

It may be assumed, therefore, that there is no lack of maternal tenderness in the very poorest mothers, and that any rational instructions, or help, sensibly

given to them, to do better by their children will be most welcome. If we have hitherto failed it is because we have not got at these poor women in the right way.

*Circumstances in the parents and house lowering the vitality of the infant and favouring infection.*

We may assume that where one or other parent is intemperate there will be a liability to dirty conditions in the house; but that there is almost certain to be dirt where the mother is intemperate. In 33 out of the 102 houses, one or other or both parents were intemperate. In 15 the mother was intemperate. It is not merely dirt that is in question where intemperance is concerned, but the care and vigilance which an infant demands from the mother.

The mother or nurse was noted to be not clean, or dirty, in 31 instances.

The mother was observed to be ailing in 34 instances, and both parents in 2 instances. In 34 instances the house was observed to be dirty, in 7 very dirty. In many instances the houses were spotted over with fly-dirt.

In 22 instances none of these conditions prevailed. In 14 instances the mother was ailing, but no other unfavourable conditions prevailed.

Taking as our definition of overcrowding that there shall be two or more persons to a room, 31 out of 100 houses were overcrowded. In 6 of these no other unfavourable influence previously mentioned obtained in the house. If the above definition of overcrowding be considered rather stringent, it is to be remembered that the living rooms usually equal the bedrooms in number, and that the former are not used for sleeping purposes.

The living rooms were badly lighted in 23 instances, of which 3 were unconnected with defects previously mentioned.

Thus, in all but 14 of the houses, there were present, in the personal habits of the parents, or in the conditions of the house or household, influences unfavourable to the health of the child, and to a lesser extent favourable to infection.

*There are, however, other insanitary conditions which are associated partly with the source of infection and partly with lowered vitality.*

Chief of these are the presence of pails and middens, visited as they are by crowds of flies.

When pail closets are defective, and the ground becomes contaminated, the sources of contamination are extended. The nearer these are to the houses the more heavily must the atmosphere be loaded with infective particles, and



the direct conveyance of infection by dust, especially in dry weather, is a possibility not to be disregarded. Defective drainage rendering the yards and passages foul will also act injuriously. Nor must we altogether neglect sodden conditions of the yard surface.

Vast numbers of the spaces between the backs of houses are very narrow, and contain numerous pail-closets, which cause the atmosphere in very hot weather to be fœtid, especially during and after emptying of the pails. The dust then dispersed must be loaded with fæcal particles.

Now these conditions are present all the year round, and there must be superadded something to give them their special potency in the third quarter of the year. They do not, of themselves, appear to be sufficient to cause the disease to become epidemic, though, like direct infection, they may be powerful enough once the disease has spread. Is this added potency due to growth of specific organisms in the polluted soil or to the increased infectivity of the fæcal matters from an increased number of cases of Diarrhœa, brought about in some other manner?

The course of recent research has been to throw increasing doubts on the theory of overgrowth of particular micro-organisms in the soil, and to favour the idea that this disease is spread by increased facilities for communication.

When, however, fæcal matter has become infectious, its dispersal near houses may act directly without any intermediate carrier, and this action may be present whenever the surface is dry.

This much is certain, that, were the contents of middens and pails carried off directly by water, there would be comparatively few foci of infection for flies to visit, or for air currents to waft about.

In 93 houses the closets were: pails, 69; middens, 5; water-closets, 29. Of the 69 pail-closets, 29 adjoined the house, while 1 communicated with the interior, and 14 were at no greater distance than 4 feet. In these pail-closets defective conditions, such as absence of guide, floor wet and sunk, floor dirty, pail overflowing, were noted in 31 instances. In 4 of the 29 water-closets defects were also noted.

Very few defects in drains were observed; in 8 instances some defect was noted in the yard or house drain; in 6 instances the passage drain was blocked.

The accumulation of infection denoted by the above conditions must be very considerable. Yet, as already stated, it is in summer that the danger is most pronounced, whether from the aërial carriage of infective materials or from the movements of the house-fly. A material reduction of infectious disease is to be expected when middens and pails have given way to water-closets.



One heading is of special significance. It has already been mentioned how numerous are the narrow back spaces between houses, made up of 2 small yards, separated perhaps by a 4-foot passage, into which open the doors of the ash-places containing the pails for excreta and the wooden ash-tubs for ashes. When these are emptied there is often some spilling, and the passages are brushed by way of cleansing them. A layer of material is left, odorant in warm weather, and one that dries very readily. It is not, however, to this that the observation refers, "Passage offensive in 8 instances," but to leakages from the ashplaces. Many of the houses have very small yards, which have, not infrequently, loose flags. Yet, on the whole, the condition of the yards is much superior to that of the passages. Occasionally the drain in the yard is defective, and in one or two instances the surface of the yard is offensive.

A considerable improvement is becoming manifest in the burning of vegetable refuse, fish heads, etc., but there are many exceptions, especially in the Jewish quarter. The importance of this lies, not merely in the fact that such material is offensive, but in the breeding grounds that such garbage affords to the house-fly.

The Inspectors should insist on all vegetable and animal refuse being burned on the kitchen fire.

Diarrhœal motions were observed in different situations: on a scullery floor, on a bedroom floor, on a yard surface, and in a passage. This is a danger, small compared with others which have been mentioned, yet one which should not be overlooked by Inspectors.

If we consider all the conditions tabulated under the last heading, we find that only 17 houses are free from conditions under the last heading, of a character liable to affect health seriously; while only 3 of the 14 houses, free from defects under the first grouping, are also free from external defects.

*Are multiple deaths of infants in the same family due to dirt and  
carelessness in the mother?*

At this point we may usefully consider Dr. Hope's statement that Summer Diarrhœa tends to recur in the same family, and is then associated with dirty habits in the parents. The analysis which I gave last year of multiple occurrences of fatal Diarrhœa in the same family did not appear to bear out this contention, but rather pointed to special weaknesses or diseases affecting those families, in which such repeated attacks occurred.

The households in which previous deaths from Diarrhœa are ascertained to have occurred in 1905, out of the 101 specially investigated, number 18, and may be exhibited thus :—

No. of case	No. of previous deaths in children from Diarrhœa	No. of previous deaths in children from other causes
15	2	.....
17	2	2 from 'Convulsions.' 4 children had Diarrhœa in 1904 and recovered.
27	1	1 from 'Pneumonia.'
31	1	.....
38	2 (1893 and 1901)	4 { 1 in 1895 from 'waste.' 1 in 1896 from 'waste.' 1 in 1898 from 'waste.' 1 in 1903 from Bronchitis and Consumption of the bowels.
41	2	Twin to 41 died of "Pneumonia," though the illness seems to have been really Diarrhœa. Uncle died of Phthisis in 1904. A Consumptive person lives here.
54	2	A brother, æt. 6, has had Paralysis for 4 years, and is wasting to a skeleton.
62	1	2—1 tabes. 1 abscesses in the neck.
64	1	1 'Convulsions.'
66	1	4 { 1 Convulsions from birth 1 coughed and wasted. 1 æt. 3 weeks. 1 abscesses in neck. Mother has weak chest.
70	1	.....
77	2	1 'Convulsions.'
102	2	1 'Convulsions.'

As regards 15, the conditions noted are: Both parents intemperate. The mother is not clean. The house is dirty. The floor of scullery is broken. The pail-closet adjoins, and the ashplace floor is wet and sunken, while the pail and ashbox are overflowing. There is a water-stand pipe in the passage. The yard is very small. The house is badly lighted.

17.—The mother is not clean. Both parents are weakly. The house is dirty. The floor of the living room is defective. The pail is leaking, and urine is running over the yard. The floor of the ashplace is wet and sunken. The living room is badly lighted.

27.—No defect is perceived in the parents, house, or surroundings.

31.—No defect is perceived in the parents or house. The bedroom windows do not open. The pail-closet is only 2 feet from the house. The yard is very small.

38.—No defect is perceived in the parents, house, or surroundings.

41.—The father is intemperate. The mother is not clean. The house is dirty. There is no ashbox to the closet. The light is bad.

54.—The father is intemperate. The nurse is untidy, dirty, and careless. House dirty. A pail-closet adjoins the house. The yard is very small and confined.

62.—No defect in the parents or house. The drain in the passage is stopped.

64.—Floors and ceilings of house black. Pail adjoins, floor wet and sunken. Passage sough defective. Parents clean and healthy.

66.—Mother ailing, but clean. House clean. Pail adjoins the house. Ash-place floor very dirty. Flag sunk near the sough in the yard, holding urine.

70.—Mother slovenly. Has left Manchester, and was not seen.

77.—House dirty. Closet a midden. Pigeons kept. Parents not dirty personally, or unhealthy.

102.—Both parents are intemperate. The mother is untidy, and ailing. The house is very dirty, and is badly lighted. The pail-closet adjoins the house. The yard is very small, and the flags are broken and loose.

It will be seen that Dr. Hope's contention is borne out in cases 15, 17, 41, 54, 70, and 102, but not in 27, 31, 38, 62, 64, 66, and 77.

On the other hand, only in 38, 41, 54, 62, and 66 does suspicion arise of a special weakness in the family.

These facts are, on the whole, more favourable to Dr. Hope's contention than those collected last year, though the large proportion of fresh cases, without previous history, is again in evidence.

In 1905 a record was made of previous deaths in children when these had been assigned to 'waste,' 'convulsions,' or any cause which might be supposed to bring them into special relation with *Diarrhœa*.



The following facts relate only to these special causes of death.

The list is rather a formidable one, but will be given as briefly as possible.

Case	No. of previous Children Lost	Causes
5	1	Hydrocephalus.
6	9	2 from Convulsions. 1 from Consumption of the Bowels. 1 from Pneumonia. 5 more from causes the mother will not specify.
7	8	All from Consumption of the Bowels.
8	3	1 Convulsions and 'waste.' 1 'tabes.' 1 Diphtheria.
10	1	In 1902 of 'waste.' Sister, æt. 2, is Phthisical.
11	1	Convulsions.
13	2	Stillborn.
18	3	1 'Waste.' 1 Eczema. 1 Constipation.
19	3	1 Pneumonia. 1 Measles. 1 Concussion.
20	1	3 weeks old, 'weakness.'
23	4	3 Bronchitis. 1 Tabes. Mother has had Bronchitis many years.
28	1	Teething and Convulsions.
29	1	1 Convulsions in summer.
30	3	2 Marasmus. 1 Consumption of Bowels in 1904. An uncle died of Phthisis 3 years ago.
33	5	1 Inflammation of the Lungs. 1 Brain Fever. 1 Convulsions. 1 Paralysis of the Brain. 1 Consumption of the Bowels. A sister has now Spinal Meningitis. Mother has weak chest. An uncle died of Phthisis 4 years ago.
35	2	1 Pneumonia. 1 Suffocation. Brother has 'flux.' Mother's father and sister died from Phthisis. She is 'weakly.'
50	2	1 Tubercular Meningitis. 1 Convulsions from birth.
52	5	4 Convulsions. 1 Measles. The 4 deaths from Convulsions all occurred in summer.
53	3	1 Pneumonia. 2 Convulsions and 'waste.' 3 Rickets. Mother apparently tuberculous.
58	5	3 'Waste.' 2 Tuberculous.
60	2	1 Convulsions. 1 Pneumonia.
69	3	1 Bronchitis. 1 'Waste.' 1 Whooping Cough. Mother 'weakly.'
73	3	1 Inflammation of Lungs. 1 Bronchitis and Convulsions. 1 Convulsions.
78	4	1 Membraneous Croup. 1 Convulsions. 1 Premature Birth. 1 Teething and Convulsions.
80	2	1 Convulsions. 1 Burns.
88	4	3 Convulsions. 1 Consumption of Bowels.
104	1	1 Bronchitis and Convulsions. Mother has a cough.

From an analysis of the causes of death of infants given under the heading "Infantile Mortality" in the Annual Report for 1904, we learn that the number of deaths of infants per 1,000 born from 'wasting diseases' and 'tubercular disease' is, like that of infant Diarrhœa, greatest in the third quarter of the year, and that the number of yearly deaths per 1,000 born from these causes goes up and down with the number of yearly deaths from Diarrhœa over a series of years. The correspondence in the fluctuations is also markedly shown in the third quarter.

What is the significance of this correspondence. Largely, no doubt, it is due to the effect which previous bad health has in the production of fatal Diarrhœa. But this is not the whole story. The number of deaths from 'wasting diseases' is very high in the fourth quarter of the year, due, no doubt, to the injured condition of the bowels left by Diarrhœa. Then, again, as a large series of post-mortem examinations made in Kiel showed, the deaths assigned to tubercular disease in the early months of life must be in a considerable measure fallacious; very many of them must be due to wasting disease associated with malnutrition, and are probably often from Summer Diarrhœa. The number of yearly deaths from Convulsions goes up and down, in a general way, with the number from Diarrhœa. But there is no relationship between the mortalities in the third quarter from Diarrhœa and Convulsions, a rather remarkable fact when we consider that Diarrhœa often begins, and usually terminates with Convulsions. Rather there seems to be an inverse relation, as if, in proportion to the fewness of the deaths, Diarrhœa tended to be suppressed, and to be supplanted by Convulsions.

No correspondence is found between the death-rates from Diarrhœa in the third quarter of the year and the death-rates in that quarter from lung disease.

The conditions noted corresponding to the above cases were:—

No. 5.—Parents intemperate; mother not clean, house very dirty. Pail-closet adjoins, no guide, floor of ashplace very dirty. Yard very small, passage dirty. Drain in passage blocked. House badly lighted.

No. 6.—Parents intemperate; mother not clean, and ailing, house very dirty. Walls and floors of living-room defective. Pail is leaking. Passage dirty. Drain in passage blocked.

No. 7.—Father intemperate.

No. 8.—Mother ailing. Pail adjoins; no urine guide. Passage offensive.

No. 10.—House not clean. Pail adjoins; dried excreta on scullery floor.

No. 11.—Pail distant 3 feet; floor of ashplace sunk.

No. 13.—Cistern of water-closet defective. House badly lighted.

No. 18.—Mother not clean. Temperate (?) Diarrhœal motions observed on yard surface.

No. 19.—Living-room floor dirty, dirty hearthrug, walls spotted with fly-dirt.

No. 20.—Mother ailing.

No. 23.—Both parents intemperate. Mother dirty. House very dirty.

No. 26.—Sough in passage stopped.

No. 29.—Both parents intemperate. Mother untidy. House dirty. Scullery flags defective. Yard very small. Drain in yard defective. Lighting of house bad.

No. 30.—Both parents intemperate, mother dirty, house very dirty. Pail closet defective. Flags in yard broken.

No. 33.—Mother has weak chest. House dirty. House badly lighted.

No. 35.—Mother weak. Pail adjoins. Floor of ashplace wet and sunk. Yard contains 2 cracked flags, which hold water.

No. 50.—Cistern of water-closet does not act.

No. 52.—Both parents intemperate. Mother untidy. House not clean. Midden dilapidated. Yard small and confined, flags broken and loose. Snails crawl about the living room floor, which is damp.

No. 53.—Both parents intemperate. Mother ailing. House dirty.

No. 58.—Mother ill. House dirty. Floor of ashplace wet and sunk. Yard very dirty. Yard drains stopped.

No. 60.—Water-closet basin dirty. Loose motions in yard.

No. 69.—Nothing observed.

No. 73.—Pail distant 4 feet, has no urine guide. Flags loose.

No. 78.—Midden wet.

No. 80.—Mother not clean. Lighting of house bad.

No. 88.—Mother careless and untidy. Everything in house fly spotted.

No. 104.—House moderately clean. Mother has a cough. Vegetable refuse not burned. Pigeons kept

It will have been observed in the above cases that we must in strictness draw a distinction in the above 27 cases between previous deaths from 'Waste' and 'Tubercular Disease' in one group, Convulsions in another, and such conditions as Lung Disease in a third.



We can now exhibit the results of this inquiry thus. Excluding 2 deaths in old people, and 2 deaths in one house not specially investigated, we get 98 houses containing 98 cases of fatal Diarrhœa in children.

	Mother untidy in person	Mother ailing but not intemperate	Mother intemperate	House dirty
98 houses .. .. .	32	30	15	34
13 houses in which more than one death from Diarrhœa has occurred .. .. .	6	2	2	6
27 houses with multiple deaths in children from assigned causes .. .. .	10	5	7	12
Of the above 27, those in which previous children died of 'waste' or 'tubercular' disease to the number of 14 ..	7	3	5	9
Of the 27, those in which previous children died of Convulsions, but not of 'waste' or 'tubercular disease,' 7 in number .. .. .	3	..	2	3
Remaining 6 .. .. .	—	2	—	—

This table does appear to indicate a connection between slovenliness in the mother and multiple deaths in children, whether from Diarrhœa, or from the closely allied causes 'Waste' and 'Tubercular Diseases,' or from the less closely allied cause 'Convulsions.' It requires considerable extension, however, before definite conclusions can be drawn.

No less evident, however, is the connection between illness in the mother, and also in other children, with the occurrence of fatal Diarrhœa.

In the course of these observations I have assumed the infectious character of Summer Diarrhœa, but I will here interpose the history of infection in the 98 cases of children selected, and then resume the consideration of the influences favouring fatal Diarrhœa in infants.

#### *Summer Diarrhœa an Infectious Disease.*

There can be no doubt that Summer Diarrhœa is an infectious disease. There is reason to believe that it not infrequently appears and spreads in public institutions. Whether the epidemic dysentery described by Dr. Mott, in his

communication to the Epidemiological Society, as occurring in asylums, is entirely distinct from the ordinary fatal Summer Diarrhœa is open to doubt. Be that as it may, he clearly shows its infective character, and considers that it is generally conveyed by the hands of the attendants. The series of cases which I gave last year appears to show that Summer Diarrhœa is equally communicable. As this is an important point, I give, again, a full history of the facts ascertained with regard to exposure to infection in the fresh series of cases, only noting that, occasionally, the power of flies to convey infection is assumed.

History of infection of 102 cases specially investigated in 1905 :—

Case 1, f. æt. 13 months. Took ill June 16th. Died June 18th. Father began on June 26th with Diarrhœa, followed by Nephritis and Pleurisy. His illness lasted altogether 6 weeks (subsequent case).

Case 2, m. æt. 3 months. Took ill June 17th. Died July 13th. Twin sister took ill July 13th, and her illness was severe and prolonged. Mother took ill July 20th (after eating chips), and was ill a few days. Case 2 had the clothes left by a little cousin who died of a waste in June. It is possible that these illnesses were all Enteric Fever.

Case 3, f. æt. 5 months. Took ill June 20th. Died July 24th. This is a narrow street, in which there have been a number of cases, and the mother sat with the child on the doorstep and chatted with the neighbours. The mother took ill on July 31st with vomiting and Diarrhœa, and the father on August 7th. This child was, almost certainly, tuberculous. (Subsequent cases.)

Case 4, f. æt. 11 months. Took ill June 21st. Died July 1st. A brother (æt. 4) began to be ill with Diarrhœa June 19th, his attack being ascribed to eating gooseberries off the street.

Case 20, f. æt. 3 months. Took ill July 13th. Died July 17th. The grandmother who helped to nurse this child took ill with Diarrhœa on July 16th. (Subsequent case.)

Case 21, m. æt. 6 months. Took ill July 14th. Died July 21st. His cousin, a baby, had Diarrhœa during the first and second week of July; visited this house many times, and soiled the floor twice during the week previous to the illness of case 21.

Case 22, f. æt. 5 months. Took ill July 27th. Died July 28th. This infant also suffered from Diarrhœa from July 15th to July 19th, but appeared to recover. On July 26th mother took this child to visit a baby dead of Diarrhœa on July 23rd. It is doubtful whether this was a relapse or a fresh infection.

Case 23, f. æt. 2 months. Took ill July 15th. Died July 20th. Father, who sleeps in the same bed, was ill with Diarrhœa 3 days—July 12th to 15th. This infant was probably tuberculous.

Case 24, m. æt. 11 months. Took ill July 15th. Died August 5th. In December, 1904, this child's mother suffered from Enteric Fever; in January, 1905, the father and two lodgers had also Enteric. A boy (age  $2\frac{8}{12}$ ) had a suspicious illness before the parents, but gave a — reaction. Case 24 had, in February, 1905, loose green motions. The blood was tested, and gave a —<sup>ve</sup> reaction. Since that time his health had been poor. It is not improbable that the illness from which he has now died was Enteric Fever.

Case 25, f. æt. 5 months. Took ill July 15th. Died July 20th. Sister (æt.  $1\frac{5}{12}$ ) took ill with Diarrhœa on July 18th. (Subsequent case.)

Case 27, m. æt. 3 months. Took ill July 16th. Died July 27th. Visited next door neighbour, where a child has been ill on and off with Diarrhœa for 6 weeks. He is now dying. The mother of this infant had Enteric Fever 18 months ago, and a baby died of Enteric 16 months ago. His father died of Pneumonia on March 6th, 1905. It is not improbable that case 27 was also Enteric Fever.

Case 28, m. æt. 10 days. Took ill July 17th. Died July 25th. The mother took ill with Diarrhœa on July 29th, and was ill 4 days. (Subsequent case.)

Case 29, m. æt. 6 months. Took ill July 18th. Died July 22nd. The mother has come in contact—the baby being on her arm—with a case of Diarrhœa at a neighbour's house, who began to be ill on July 10th. Another child at this neighbour's house began with Diarrhœa on July 18th.

A relative's baby is often in the house of case 29, and began with Diarrhœa on July 23rd.

Case 32, m. æt. 6 months. Took ill July 18th. Died July 22nd. Mother goes out to work. Infant left with a drunken woman. The pail-closet at this woman's house opens into the scullery. There have been two cases of Diarrhœa at this house prior to case 32.

Case 33, m. æt. 7 months. Took ill July 18th. Died July 20th. Sister (æt. 2) had Diarrhœa from July 11th to July 18th, ascribed to eating raw potatoes. Infant probably tuberculous.

Case 34, f. æt. 7 months. Took ill July 19th. Died July 26th. Brother (æt. 3) had Diarrhœa in the last week of July.

A washerwoman who comes here once a week lost a child from Summer Diarrhœa on August 23rd; ill since August 8th.



Case 35, f. æt. 9 months. Took ill July 19th. Died July 20th.

House visited on August 2nd and 3rd. Evacuations noticed on the street on both dates. There was a previous case of Diarrhœa in the house opposite, and there have been other cases in this street. The mother states that there was a tremendous number of flies while the child was ill. Probably fly-borne infection.

Case 36, f. æt. 6 months. Took ill July 20th. Died July 23rd.

There has been a number of cases in this narrow street, and baby was placed in a chair in the street.

Mother chars at a house at which the baby had an attack of Diarrhœa from July 15th to July 19th.

The brother of case 36 (æt.  $2\frac{1}{2}$  years) suffered, when 15 months old, with Diarrhœa for 6 weeks; recommenced in August, 1905.

Case 39, m. æt. 4 months. Took ill July 21st. Died July 24th. Mother died May 11th of Pneumonia; sister had Pneumonia for 2 weeks in April. The foster mother often took the child into a neighbouring street in which there have been several deaths and a number of cases of Diarrhœa. The infant, however, has had Diarrhœa since the death of the mother. The number of flies has been tremendous.

I suspect that this was not Summer Diarrhœa, but Enteric Fever.

Case 40, f. æt.  $2\frac{3}{4}$  months. Took ill July 21st. Died July 24th.

There had been a number of cases of Diarrhœa in this neighbourhood when the child took ill. The number of flies was then tremendous.

Subsequent cases:—Child æt. 8, onset July 25th. f. æt. 38, onset July 27th. m. æt. 38, onset August 11th.

Case 41, m. æt. 8 months. Ill from birth with Diarrhœa. Died July 18th.

This child was, no doubt, Tuberculous. Cousin (æt. 2) began with Diarrhœa June 29th; severe attack. Died of Measles July 21st. It is quite certain that Summer Diarrhœa is exceedingly liable to be superposed on tuberculosis of the bowel, and it is probable that case 41 contracted Diarrhœa from his cousin.

Case 44, m. æt. 9 days. Birth to death on August 4th. Nearly all the children in this street have suffered from Diarrhœa. Neighbours in and out continually. Flies numerous. There is here plenty of opportunity for infection.

Case 45, m. æt. 1 month. Took ill July 26th. Died July 31st.

There was a case in the house opposite. This infant also died on July 31st, but was ill a week prior to case 45. The mothers have chatted together, the babies in their arms. Number of flies moderate.

Case 46, f. æt. 5 months. Took ill July 26th. Died August 2nd.

Cousin has had Diarrhœa for 6 weeks. Case 46 has been taken by mother to her sister's house every day, and sometimes several times a day.

Case 48, f. æt. 5½ months. Took ill July 27th. Died August 17th.

Grandfather has often nursed case 48. Has suffered from Diarrhœa, commencing in the second week in July.

Case 50, m. æt. 5 months. 25, Oldham Road Buildings. There have been previous cases at 19 and 20, and as the number of flies here is immense, it is probable that the infection has been carried by them.

Case 51, m. æt. 7 months. Took ill July 28th. Died July 31st.

From July 17th mother took infant to Ancoats Hospital because it was wasting. On July 27th she had to wait 1½ hours, and sat next to a woman, with whom she conversed, who had a baby suffering severely from Diarrhœa. This woman showed her its motions. This diarrhœal infant died in the waiting room.

Case 52, f. æt. 8 months. Took ill July 29th. Died August 14th.

This infant had pork fat, pig's cheek fat, gravies, unboiled milk, etc. At the same time the father took ill with vomiting and Diarrhœa, and brought up a quantity of pork fat. He was ill 4 days.

It is probable that both were infected by the pork.

Strictly speaking, this history does not belong here, but is inserted as it seems worth recording.

Case 53, m. æt. 3 months. Took ill July 30th. Died August 6th.

Father (æt. 33) had onset of Diarrhœa July 20th. Ill a few days.

Brother, æt. 7. Onset August 7th. Ill 3 days.

Brother, æt. 3. Onset August 10th. Ill a few days.

Brother, æt. 2. Onset August 10th. Ill a few days.

Previous and subsequent.

Case 54, m. æt. 11 months. Took ill July 30th. Died September 7th.

Brother (æt. 6) has had Diarrhœa off and on all the summer.  
(?) Tuberculous.

Brother (æt. 7) began with Diarrhœa on September 14th.

Number of flies tremendous.

Case 55, f. æt. 4 months. Took ill July 31st. Died August 6th.  
Previous case in house opposite, died July 31st. No contact.  
Number of flies tremendous.

Case 56, f. æt. 8 months. Took ill end of July. Death August 31st.  
Sister (æt. 9 years) began with Diarrhœa 3 days before case 56.  
Another child (æt. 2 years) began on same day as case 56.  
Mother (æt. 32) began with Diarrhœa during the illness.  
The number of flies has been tremendous.

Case 57, m. æt. 2 months. Took ill July 31st. Died September 4th.  
On July 30th the teat of the bottle belonging to case 57 was placed in the mouth of a neighbour's child, who was then suffering from Diarrhœa. This child recovered, but has had a relapse.

Case 59, m. æt. 11 months. Took ill August 6th. Died September 3rd.  
Brother (æt. 2 years) had a slight attack of Diarrhœa a few days prior to case 59. They slept in the same room.

Case 60, f. æt. 8 months. Took ill August 8th. Died August 11th.  
Child (æt. 3 years) began August 20th, and was ill a few days.  
Two grandparents have visited here often during the summer, and both suffered from Diarrhœa prior to onset of case 60.

Case 61, m. æt. 2 months. Took ill August 31st. Died September 4th.  
Brother (æt. 9 months) began with Diarrhœa August 10th; now under treatment.

Also visited a house on August 12th where there was a case of, and subsequently a death from, Diarrhœa on August 14th.

Case 62, m. æt. 11 months. Took ill August 17th. Died August 23rd.  
Father began with Diarrhœa August 14th. Ill a few days. Slept in the same bed.

Brother (æt. 5) began with Diarrhœa on August 30th.

Case 63, f. æt. 10. Took ill August 20th. Died September 7th.  
Father had Diarrhœa from August 15th to August 22nd. Slept in the same bed.

Case 64, m. æt. 9 months. Took ill 6 weeks before death, appeared to recover, then again took ill August 22nd. Died September 3rd.

Said to have been no subsequent illness, but on September 19th loose motions were observed in the yard.



Case 65, m. æt. 2 months. Took ill August 24th. Died September 1st. Child (æt.  $1\frac{5}{2}$ ) has had loose motions for 5 weeks.

Case , f. æt. 11 months. Took ill August 26th. Died September 5th. A brother (æt.  $2\frac{1}{2}$ ) has had an attack of Diarrhœa during the summer, but mother's memory is so bad she cannot give dates.

Case 70, f. æt. 9 months. Took ill August 27th. Died September 2nd. A case of Diarrhœa (onset August 24th, death September 1st) occurred a few doors away. The mothers are friendly, but there has been no contact. Flies numerous.

Case 71, m. æt. 4 months. Took ill August 31st. Died September 3rd. Mother began with Diarrhœa about August 17th. Ill 1 week. Baby slept with mother, who rubbed baby's gums with her finger.

Case 72, f. æt. 3 months. Onset September 1st. Died September 7th. Child (æt. 3) began with Diarrhœa September 7th.

Child (æt. 5) began with Diarrhœa September 9th. (Subsequent.)

Case 73, m. æt. 11 months. Onset September 1st. Died September 5th. Sister (æt. 2 years) began with Diarrhœa August 26th; severe attack. She soiled the floor often, and slept in the same room with case 73.

Case 74, f. æt. 10 months. Ill August 17th; recovered; relapse September 2nd. Death September 5th.

Sister (æt. 3) had a slight attack during the summer.

Grandmother had an attack of Diarrhœa. Onset September 2nd. Ill till September 9th.

Case 75, m. æt. 23 days. Ill from birth (?). Death September 24th.

Mother began with Diarrhœa on September 7th, and was ill a few days.

Case 76, f. æt. 4 months. Ill September 6th. Died September 7th.

Father began with Diarrhœa August 31st; frequently vomited for a week. He was ill for 10 days, and slept with baby.

Case 77, f. æt. 5 months. Ill September 9th. Died September 23rd. Three previous cases in the neighbourhood and one Enteric. Tremendous number of flies.

Case 78, f. æt. 16 months. Ill June 17th. Died August 30th. Mother states that the child did not suffer from Diarrhœa till after she took her to Ancoats Hospital, where she often had to wait 2 hours. There were other infants in the waiting-room. (See Case 51.)

Case 79, f. æt. 21 months. Ill June 25th. Died June 28th.

Brother (æt. 4) began with Diarrhœa on June 12th. Ill 2 weeks; severe attack, soiled the floor. Slept with case 79. Mother says he picks things off the street and eats them; also roots in ashboxes.

Case 80, f. æt. 19 months. Onset July 13th. Death August 8th.

Brother (æt. 8 years) began a few days after August 8th. Was ill 4 days and recovered. (Subsequent case.)

Case 81, f. æt. 12 months. Ill July 15th. Died July 20th.

Child in opposite house, onset July 21st. They use the same closet as case 81. (Subsequent case.)

Brother (æt. 3) began with Diarrhœa July 28th. Still loose in his bowels August 4th, 1905.

Case 82, m. æt. 12 months. Ill July 16th. Died July 27th. Child ailing. Took him to surgery every 2 or 3 days from July 11th. Boy æt. 19 years began with Diarrhœa on July 28th in house opposite. Number of flies tremendous. (Subsequent.)

Case 83, m. æt. 23 months. Took ill July 16th. Died July 21st.

Brother (æt. 8) took ill with Diarrhœa a few days after case 83. (Subsequent case.)

Mother took her infant to a house where a baby (æt. 8 months) was taken ill with Diarrhœa in the first week of July; did not go inside. This baby is ill now. Infection probably transferred by mother's fingers.

Case 85, m. æt. 14 months. Took ill July 24th. Died August 3rd.

Baby at neighbouring house ill of Diarrhœa before case 85 often brought here.

Another baby, ailing 5 weeks, also visited here.

Slops emptied in street sougths where this child played.

Case 86, m. æt. 15 months. Took ill July 27th. Died August 4th.

Brother (æt. 10 weeks) began with Diarrhœa August 9th.

Case 86 used to run into neighbour's at adjoining dwelling where there was a child ill with Diarrhœa up to July 21st.

Case 87, m. æt. 12 months. Took ill July 29th. Died August 9th.

Child crawled about the corridor of dwellings where other children have soiled the floor.

Also his cousin had Diarrhœa for a week prior to case 87. These two children crawled about together, and were often in cousin's house, in which the floor was soiled by cousin.

Case 88, m. æt. 18 months. Took ill July 31st. Died August 4th.

Mother began with Diarrhœa on July 29th.

Brother (æt. 10 weeks) began with Diarrhœa on August 5th, and died of Diarrhœa in Ancoats Hospital on August 24th.

Case 89, f. æt. 19 months. Took ill August 11th. Died September 22nd. Child tuberculous.

A number of cases of Diarrhœa have occurred in this street. Tremendous number of flies.

Case 90, m. æt. 12 months. Took ill August 17th. Died August 20th.

Often taken to grandmother's, who suffers from chronic Diarrhœa. Mother had Diarrhœa August 15th to 17th, with vomiting, and was ill a week.

Case 91, f. æt. 15 months. Took ill August 20th. Died September 6th.

Mother nursed a child (æt. 17 months) who died from Diarrhœa on August 12th. This child's clothes were subsequently worn by case 91.

Father took ill with Diarrhœa on September 11th.

Mother took ill with Diarrhœa on September 17th. Severe attack.

Case 94, m. æt. 3. Took ill September, died September 3rd. Baby (æt.  $1\frac{5}{12}$ ) began with Diarrhœa August 27th. Ill till September 6th.

Mother (æt. 32) began with Diarrhœa August 31st.

Brother (æt. 4) began with Diarrhœa September 7th.

Case 97, m. æt. 14 months. Took ill at age of 2 weeks, recovered, recommenced with Diarrhœa March 7th. Died March 16th.

Child (æt. 6 months) had Diarrhœa from birth; now recovered. Slept in the same bed with case 97.

This child (case 97) is clearly tuberculous.

Case 100, f. æt. 6 months. Began to be ill May. Died August 29th.

Case 101, f. æt. 2 months. Began to be ill August 22nd. Died September 1st.

These two patients live in the same house. The brother of case 101 was taken ill with Pneumonia on May 3rd, and is still under medical treatment (September 18th).

Possibly these cases may be Enteric Fever.

We may sum up these histories thus:—

Out of 102 fatal Diarrhœal affections we find that 34 stand in relation with 44 previous illnesses, and 2, by the medium of flies, with other cases in the neighbourhood. 12 stand in relation both with previous and subsequent cases,



of whom 2 stand in relation also with a simultaneous case. The number of cases related to the above 12 is 30—viz. : 14 previous, 2 simultaneous, and 14 subsequent. 13 other cases came into relation with 19 subsequent cases. Thus we get altogether 61 cases coming into relation with 93 other illnesses. A perusal of the histories appears to show that direct infection plays a very important part in this series. It will be seen that this history of infection is very similar to that given last year, and it seems difficult to understand how such a small proportion of direct infection has been arrived at in other histories. One can only assume that the same trouble has not been taken to elicit the facts.

We have not shown, however, how the infection is actually brought into the child's system in the above series, nor from what sources it comes into the family.

In considering the mode of spread, we must bear in mind that there is, at all seasons, a considerable prevalence of Diarrhœa, while usually in the third quarter of the year the number of fatal cases shoots up abruptly, and descends with equal abruptness towards its close. There is, therefore, some special influence leading to its spread at this season. The chief influence, we concluded, from the analysis given last year, was, probably, the conveyance of infection by the house-fly, though the multiplication of the infective matter in milk was not thereby put aside, nor indeed other adjuvant causes.

The power of the house-fly is, however, only relative, and may be nullified by cleanliness and by attention to precautionary measures.

It is, therefore, necessary that we should consider not only what must be done to safeguard the food of the infant, but what are the sources from which infection is derived and carried to so many houses, and what are the influences by which our precautions are liable to be baffled.

We may now consider what are the modes in which infection is introduced into the system.

*Abundant centres of infection at all seasons.*

We have seen that 48, out of 98 children specially investigated, have been brought into close relation with previous cases of Diarrhœa in the same house. It is probable that, if all the information asked for had been given, this number, large as it is, would have been increased. Referring to the facts collected by Dr. Ballard, it will be sufficient to quote those relating to 4,516 cases of Diarrhœa newly occurring in the poor law practice of Islington during the five years 1857, 1859, 1860, 1861, and 1862. Of these, there were, under one year of age, 682 = 15.1 per cent. of total; one year and under 5 years 1,451 = 32.1 per cent. of total; five years and upwards 2,383 = 52.8 per cent. of total.

It will be seen from these figures that neither the deaths, which are mostly of infants under one year of age, nor the histories of infection obtained give any idea of the numerous cases of Diarrhœa in older persons.

These figures bring home to us the enormous number of cases of Diarrhœa. If we assume that one infant under 12 months of age, out of 5 attacked by Diarrhœa, dies, taking the moderate number of deaths for Manchester of 500 under one year of age, we should have 2,500 total cases under one year of age, on the basis of the Islington figures, and 16,667 at all ages per annum. The above figures, be it observed, are only used to give ratios.

At page 212 of the Annual Report for 1904 is given the number of deaths from Diarrhœa in each quarter of the year for the 10 years 1894 to 1903, and the means. These were :—

1st Quarter.	2nd Quarter.	Third Quarter.	4th Quarter.
45	.. 52	.. 559	.. III

Of the 16,667 annual cases assumed, which it will be seen is well under the mark, 1,136 would fall, on the basis of the above figures, in the 2nd quarter of the year.

It will thus be seen that, given any means of transference of the infection to the infant's mouth, there is no lack of centres of infection from which it can be carried.

Diarrhœa may be transmitted by older persons.

It might be said why go further. We have already seen that the hands of the attendants in public institutions carry dysentery. *A priori* why should not the hands of the person attacked by Diarrhœa carry Diarrhœa. We have, however, to explain the abrupt rise in the third quarter, and the manner of it. Apparently, house after house is invaded in rapid succession, the infants being attacked without any history of previous Diarrhœa to be obtained in the older members of the household. When this occurs, moreover, there is nothing known which should give rise to an outburst of Diarrhœa in older persons rather than in the infants, except, perhaps, fruit, the influence of which must be partial.

The possibility should be borne in mind that Diarrhœa may be communicated to a considerably greater extent in the third quarter by neglect of, or on the part of, older persons previously attacked by Diarrhœa than is the case in the other three quarters of the year.

*Diarrhœa generally communicated by matters swallowed.*

We may assume that the disease is generally communicated by matters swallowed. It does not, therefore, follow that it is never contracted primarily in the **act of inhaling**, especially when, as often happens, the infant breathes



entirely by the mouth. It is, indeed, far from improbable that direct infection occurs in not a few cases in this way, especially where there has been a prior case in a young child in the same house not carefully attended to, or where, with confined backs to the houses and pail-closets or middens, there have been cases in neighbouring houses abutting on the same back passage.

Such cases will form only a minority, in all probability, and no epidemic extension occurs in the spells of dry weather prior to July, although these conditions are present in not a few cases. Moreover, the comparative infrequency of fatal Diarrhœa in breast-fed infants, who must often be exposed to infection, does also to some extent impair the importance of this mode of infection. Further, the absence of correspondence between the numbers of deaths from Diarrhœa and from Lung Disease points in the same direction.

If, now, the infection is generally introduced into the mouth, is it introduced with the food, or may it be introduced in other ways ?

*Diarrhœa may be introduced by rubbing the gums of the infant.*

In my last Report, attention was called to the frequent occasions on which, with a view to aid the progress of teething, the mother or grandmother rubs the child's gums with her fingers. This had been done, prior to the fatal attack, in 33 instances of the series now under consideration, and possibly in three others. On two occasions the fingers in use were noted to be very dirty.

*Infection may arise from use of the dummy teat.*

Somewhat less dangerous, on the average, is the dummy teat, which was in use by 20 infants. On one occasion it was stated that the dummy teat often fell on the floor. On another that it was often dipped in condensed milk. In a third instance it was often dipped in sugar. In 13 cases the gums were rubbed, and a dummy teat was also used. Thus either the gums were rubbed, and generally frequently, or a dummy teat was used in the case of 50 out of 98 children in whom the point was enquired into.

This appears sufficient to account for a good deal of infection, given prior Diarrhœa in the family, and would doubtless account for more infection in the third quarter than at other seasons. But it does not explain the autumnal rise of mortality.

*Infection may be carried by flies direct to the infant's mouth.*

Another possible source of infection deserves to be mentioned. In many houses in which a death from Diarrhœa occurred there was "a tremendous number of flies," which clustered about the infant's mouth and eyes. This happens, also, though possibly to a less extent, when the infant is well. May this not be the means of introducing the infection ?



To the three causes of fatal Diarrhœa just enumerated the same objection applies, viz., that the breast-fed infant is just as subject to their malign influence as the hand-fed infant. One can but say that only a partial action is suggested for them. In addition, however, it must not be forgotten that the breast-fed infant has the enormous advantage of being usually well-nourished, and easily repels invasion by an amount of infective matter which is fatal to the hand-fed infant, besides throwing off the disease when actually attacked. In fact, it is probable that the proportion of attacks in breast-fed infants to attacks in hand-fed infants is not nearly so low as the proportion of deaths in breast-fed infants to deaths in hand-fed infants.

*The child himself often introduces dirty matter into his mouth.*

This he does by biting his fingers, putting his fist into his mouth, picking up bits in back passages, crawling on the floor or in the streets, and so on. The occurrences of this kind recorded number 17.

*The specific infection may be introduced into the household  
in the infant's food.*

An enormous multiplication of bacteria takes place in milk within a few hours.

Professor Delépine has shown that many milks arrive in Manchester in such a condition as to cause the death of guinea pigs when injected into them. He has also isolated a bacillus of the coli group from such milks, and from the bodies of guinea pigs, which he finds to be identical with that causing the outbreak of milk-poisoning in Victoria Park in 1894—the Derby meat-poisoning outbreak, and, I believe, other outbreaks of Diarrhœal disease. He believes that the milks used by infants are largely responsible for Summer Diarrhœa. Not only, however, is imported milk in an infective condition when it arrives in Manchester, but it is subsequently kept for considerable periods before being sold, at the railway stations and in retail shops. In the latter it is frequently exposed to the dust of the shop, which arises largely from customers, who may very well bring in with them specific infection. In order, however, that the milk so contaminated by countless microbes, as it generally is, may produce fatal Diarrhœa, something more is needed, and this something is, no doubt, specific infection. The atmospheric temperature in June is often very high, yet we do not get an increase in Diarrhœa to correspond. Hence, if the increase is due to milk as it reaches Manchester, there must have been specific infection at the farm. Now, there is no reason to believe that Summer Diarrhœa is common on milk farms, though, doubtless, it occurs occasionally. The seed is scanty in the country, but abundant enough in the town.

Dr. Newsholme has given reasons for believing that Summer Diarrhœa is not imported into the town in the milk to any great extent.

I am inclined to go further, and to say that it is probably not chiefly in this way that the fatal infection reaches the household.

But this is not to be taken to imply that the milk, which, dirty at the start, reaches Manchester in a condition to kill guinea pigs, and is further exposed to any amount of impurity in town, is not a factor in producing fatal Diarrhœa.

I believe that such milk exercises a poisonous action, whether it be sterilised in the kitchen or on the premises of the manufacturer of condensed milk, which is probably a potent factor in preparing the child for the invasion of Diarrhœa, and in all probability such preparation is exceedingly active in the warm weather of June. Much of the antecedent illness of the victims of fatal Diarrhœa is, no doubt, to be ascribed to the frequent use of impure milk in which, though sterilised, the poisonous products of fermentation remain.

How far food, as it reaches the household, is to be regarded as the infecting agent, can only be ascertained by an inquiry into its condition prior to the attack. For the present purpose, only milk will be considered. Taking, first, the children under 12 months in whom the date of onset could be accurately ascertained, we find that cow's milk was being used by 46 infants under 12 months of age. In 31 the milk had been boiled. In 7 it was said to have been boiled, but the circumstances inspired doubt. In 8 it had not been boiled.

Eleven infants of 12 months or over were having cow's milk—in 1 case boiled, in 1 doubtful, in 11 unboiled.

In 21 instances, children were having condensed milk which was never boiled.

In 9 instances children were taking the breast with or without other food, not being milk.

In 4 instances children were not having milk.

Ninety-one cases are thus accounted for.

If, now, we remember that condensed milk, when opened, may be generally regarded as not capable of causing Diarrhœa, we see that in the great majority of instances the infection was not carried into the house in the milk.



We are thus thrown back for an adequate explanation of the autumnal rise on personal infection, aërial dissemination, and flies.

Personal infection I have already discussed. It does not appear entirely adequate to explain the sudden invasion of many fresh households. Aërial dissemination would, on the other hand, serve in a measure to explain the facts, except that it fails to effect much throughout the month of June, and at other dry seasons. We require the appearance of some means of transmission, which precedes somewhat the steep diarrhœal rise, increases with its ascent, and diminishes with its decline, and which is capable of fulfilling the purpose of dissemination.

*The Autumnal rise may be chiefly due to the Housefly.*

The housefly appears to answer the conditions applicable to a disseminating agent. It is no new idea that flies disseminate disease. They have been credited for a long time with that rôle in India, and in South Africa it was believed that Enteric Fever was largely spread by them. But in those countries they were present in immense numbers, and it appeared at first sight that there was no corresponding number available in Manchester. I showed last year that this was a mistaken impression, and the facts for 1905 strengthen the statements made in 1904, showing the great numbers in which they had visited diarrhœal households.

It has been abundantly proved, by direct bacteriological examinations, that they do carry, on all parts of their bodies, bacilli of the kind which probably cause Summer Diarrhœa, and 4 collections of flies collected with all necessary precautions and sent to Professor Delépine from houses visited by Diarrhœa were proved by him to be carrying bacilli of that character in three cases out of the four. We know, further, that they swarm about the ashplaces in which the pails containing excreta stand, and lay their eggs there. They also visit middens and collections of excreta. It is, however, even more in collections of horse manure that they breed, and the larvæ are to be found in these in countless numbers. As a matter of fact, there is a general, though not invariable, relation between large numbers of flies in the houses and the presence of stables in the immediate neighbourhood.

But their numbers are also determined, to no small extent, by the want of cleanliness in the housewife. Here, again, it is impossible to be absolute, and



to say that, whenever a house is kept very clean, it is not visited by large numbers of flies. It is probably true, all the same, that a house kept so clean that there is never any food left for flies, such as crumbs, particles of sugar, etc., is but little visited. In slovenly houses they are found in large numbers, when they do not much trouble neighbouring clean houses.

We, thus, see how it may happen that infected matters outside the house may charge with infective matters a swarm of flies, the incursion of which into houses will be largely determined by dirty or slovenly conditions inside.

Last year the number of flies collected day by day in traps, at a number of stations in different parts of Manchester, were gathered into weeks, and put over against the number of fatal cases of *Diarrhœa* commencing in the same weeks. Collecting stations at the Cleansing Department's depots in Oldham Road and Water Street yielded very large numbers of flies. These have been omitted in 1905, as it appeared to me that the correcting effect of the smaller stations, one on another, was liable to be destroyed by the large numbers gathered at particular points

I infer from the results that the numbers captured in 1905 were insufficient. Fourteen traps were used—3 at Clayton Hospital and 11 in different houses in Manchester: 3 in Ancoats, 1 in Deansgate, 1 in Chorlton-on-Medlock, 1 in Hulme, 1 in Bradford, 1 in Beswick, 1 in Ardwick, 1 in Openshaw, and 1 in West Gorton.

At every station the number of flies caught, day by day, varied greatly, showing that there was a great deal of movement of the flies into and out of houses. It is not easy to see what determines these movements. Operations such as baking and heating the boiler for washing clothes cause the numbers of flies in houses to increase largely, and, no doubt, at such times they visit cases of *Diarrhœa* in the house, and any garment which may be infected.

It might be supposed that rain would drive flies into the houses, and, doubtless, they do seek shelter somewhere from the rain. But it does not appear from the returns that the effect of rain is to increase the numbers captured in all the houses.

The weekly deaths from Diarrhœa, arranged according to dates of onset, and also according to date of death, are shown in the following table, along with the number of flies captured during the same weeks:—

	Week ending							
	June		July					Aug.
	17th	24th	1st	8th	15th	22nd	29th	5th
Fatal cases of Diarrhœa in children under 1 year of age beginning in week ending .. ..	10	9	15	12	39	58	79	72
No. of flies captured .	1527	1768	2253	2788	4456	7799	9493	9627
No. of deaths occurring in .. .. .	5	4	4	7	7	22	62	81
	August			September				
	12th	19th	26th	2nd	9th	16th	23rd	30th
Fatal cases of Diarrhœa in children under 1 year of age beginning in week ending .. ..	61	51	37	21	12	12	8	4
No. of flies captured .	8542	7112	6112	5309	5138	3815	2978	1380
No. of deaths occurring in .. .. .	89	67	81	61	61	42	20	15

In considering the meaning of the correspondence shown above, we have to remember that the number of deaths from Diarrhœa is only an index of prevalence, and does not closely represent the numbers attacked. Further, after the most careful inquiry, the date of onset is left uncertain in many cases. Then, again, the number of flies captured does not closely represent the total number of flies in circulation. Yet I think we may assume that the actual maximum was reached somewhere about the end of July. The maximum number recorded on any one day was on August 1st.

The impression produced by the two sets of figures is rather one of simultaneity than of cause and effect, and if we take the figures as indicating that flies do cause the rise in the number of cases, we must also assume that their action is very rapid.



Given a few Diarrhœal motions, however, whether in a pail-closet recess or on the floor of a dwelling or on a yard surface, and a sufficient number of flies, it is easy to see how the disease would be rapidly spread. The latent period of Diarrhœa appears to be very short as a rule, whether we judge by the histories of exposure to infection at home or by the history of Diarrhœa outbreaks due to food, is not often longer than 2 or 3 days.

Flies gather about the mouth, nose, and eyes of an infant suffering from Diarrhœa in immense numbers, and after death disappear, carrying infection along with them. Illustrations of this risk will be given presently.

As we shall see, it is not necessary to suppose that growth to any great extent takes place in the infected food, since foods such as condensed milk, sugar, bread crusts, etc., are visited by great numbers of flies.

As is well known, in putting a crust on bread, and in making rusks, a sugar is formed in the crust, which is a very great attraction for flies, and it is doubtless for this reason that flies prefer to visit careless households in which crumbs are left lying about.

It is thus quite possible to take every care as regards cooking a child's milk, and be frustrated by a fly-spotted crust being given to him to chew. All infants' food should be carefully guarded against access of flies.

If we take the number of flies recorded day by day, we find that the first sharp rise in numbers occurs from July 6th to July 9th. If we follow the numbers of fatal cases commencing day by day, we find that the first sharp rise in the number of fatal cases begins on July 10th. There is at least one day, then, and possibly three or four, between the increase in number of flies and the increase in number of cases.

Another sharp rise in the number of flies sets in on July 13th, and is maintained to July 18th. Another slighter increase in the number of fatal cases attacked begins on July 21st, but no connection can be surmised here, because on July 19th the final increase of flies sets in abruptly, and is maintained to August 2nd. No line can now be drawn. The number of fatal cases commencing reaches a maximum about July 28th, and remains at about the same level till August 2nd, when an abrupt drop takes place. Corresponding to this drop a marked fall in the number of flies occurs on August 2nd and August 3rd. A second maximum in the number of flies is reached again on August 4th, 5th, and 6th, and the number of fatal cases, commencing on August 7th, is 15, the highest on any one day up to this point.

If we study the number of flies gathered, day by day, in different districts, there appears to be a tendency for an increased number of flies to precede an increase in fatal cases by a period of 3 or 4 days.

A table has been constructed by Mr. Dunks showing for every station the number of flies captured day by day, and week by week. (Not inserted.)



A second table shows the number of fatal cases occurring in each week of the year, in every sanitary district, and in the whole City. (Table B.)

A third table shows the number of cases commencing on every day, for every district, for the whole of the sanitary districts. (Table C.)

From Tables (B) and (C) we find that the fatal cases began at very different periods in the different districts.

[These tables have not been printed for want of space.]

To see the details we must consult Table (C), but Table (B) permits a better view of the epidemic course in each district. From the latter we perceive that in nearly every district there is a definite outburst of Diarrhœa in the warm season, which lasts for varying periods in the different districts. Premising that the median period of the outburst is the week having as many cases before as after it, we may exhibit the facts thus for a number of districts:—

DISTRICT	Epidemic period began in the week ending	Lasted weeks	Median week of Epidemic period, week ending	Maximum number of Flies observed in the week ending
Ancoats.....	June 17	15	July 29	July 29th, 1 station. Aug. 19th 2 stations.
Central .....	July 1	13	Aug. 12	August 12th.
St. George's ...	June 10	15	„ 12	No station.
Cheetham ....	July 29	8	„ 19	„
Newton .....	„ 1	14	July 29	„
Bradford .....	June 10	13	„ 29	July 29th.
Beswick .....	July 15	7	Aug. 5	August 12th.
Clayton .....	„ 22	6	„ 12	August 5th.
Ardwick .....	„ 1	12	„ 5	July 29th and August 12th, equal.
Openshaw ....	„ 22	9	„ 12	August 12th.
West Gorton ..	„ 8	9	„ 12	July 29th. A second increase Aug. 19th.
C.-on-M. ....	„ 15	9	„ 5	July 22nd, 29th. A second increase Aug. 12th, 19th.
Hulme .....	„ 8	11	„ 12	August 19th. The numbers in weeks preceding consider- ably exceeded those in weeks following.

It will be seen that the correspondence between the dates of the maximum number of flies and the median point of the outburst in the respective districts is very close.

The very considerable local variations in the dates of onset and the duration of the outbursts are to be noted. To see whether this denotes the action of local causes we refer to Table C. This table does convey the impression of local outbreaks lasting one, two, or a few days, an impression especially conveyed in Newton, Chorlton-on-Medlock, and Hulme. It also shows very clearly the difference in incidence. This may be conveyed very directly, however, by simply adding the cases beginning in June and July, and again in August and September, when we get--

DISTRICT	Fatal cases of Diarrhœa beginning in	
	June and July	August and September
Ancoats .. .. .	49	29
Central .. .. .	14	27
St. George's .. .. .	34	51
Cheetham .. .. .	3	15
Newton .. .. .	22	24
Bradford .. .. .	15	14
Beswick .. .. .	4	16
Clayton .. .. .	2	11
Ardwick .. .. .	17	13
Openshaw .. .. .	8	15
West Gorton .. .. .	11	28
Chorlton-on-Medlock .. .. .	18	17
Hulme .. .. .	18	26

The suggestion made by these various data would be that the special factor concerned in the rapid increase of Summer Diarrhœa in the third quarter is the advent of flies in numbers, but that there are local circumstances, such as the number of pre-existing centres of infection, differences of convenience for the production of fly swarms, different habits of the people in regard to social intercourse, etc., which determine the period and intensity of the outburst.

It remains to consider whether in households invaded by fatal Diarrhœa the number of flies was so considerable as to be likely to have specifically infected the infants' food or otherwise to have served for the introduction of infection on a considerable scale.

Excluding two cases in one house, two houses in which the facts were not ascertained, and three deaths in January and March, we have left 95 houses.

We are informed that in 48 of these flies were at the time of the illness, and usually also at the time of visit, present in tremendous numbers, in swarms, in immense numbers, and so on. In 24 houses they were numerous. In 8 they were in medium numbers, and in 15 houses there were few.

Some of the notes appear worth copying, as showing a mode in which flies acquire infection, and also probably convey it.

Case 34. This is a butcher's shop. There have been a tremendous lot of flies, and during the illness the mother says that they stuck to the baby's eyes and lips. She could pick them off without their moving. This case was one of a nest of fatal cases over which flies were present in tremendous numbers. It will be given more at length.

Case 50. There was a tremendous number of flies just prior to infant's illness, also an immense number during child's illness; they stuck to his eyes and mouth. The flies appeared to vanish after the child's death.

Case 56. There was a tremendous quantity of flies during baby's illness, and they stuck to her mouth and eyes.

Case 73. There was a tremendous number of flies during baby's illness; they stuck to his mouth, eyes, and nose.

Case 77. Stables 100 feet away. There has been a tremendous number of flies since the middens were taken down. They stuck to the child's lips and eyes.

Case 87. A tremendous lot of flies, especially when the child was ill. They stuck to his eyes and mouth. He had to be covered with a curtain.

These cases, which must be typical, show very plainly one way in which infection is probably conveyed. The first case is especially striking, and strongly suggests fly-borne infection.

In order to illustrate further the action of flies, I now give an account of two nests of fatal cases, isolated in the midst of a community of the same social class. In both the same feature prevails that at the time of onset of the later cases, flies were present in tremendous numbers in all the houses. These two nests occur in one of the districts submitted to special investigation, and, doubtless, if a map were constructed for the whole City a number of such nests would be shown.



In these two instances the proximity of stables is a striking feature.

We may not overlook the fact, either, that while the cases are clustered thickly in particular blocks of houses, others immediately adjoining escape.

There is absolutely nothing common about the milk supply, except that it is not breast milk, save in one instance, and that it is exposed to contamination in the house. Clearly the infection is a local one.

Is it what I have named 'direct infection,' or 'transmission by flies,'

This question can best be answered by an examination of the history of the cases.

Especially in the first nest, the most careful enquiry was made as to the possibility of 'direct infection,' whether caused by a previous attack of Diarrhœa in the household, or by contact with some case outside the house.

In No. 1 nest the number of cases is 11, set forth in a table further on:—

Case No. 1. A subsequent attack occurred on August 10th.

Case No. 4. Disease contracted probably by previous contact with a case at another house (case 11).

Case No. 5. Contracted, in all probability, by visiting next door.

Case No. 7. Contracted from previous cases at home.

Case No. 8. May have been contracted by mother visiting at No. 6.

Case No. 10. Often taken to her grandmother's, who suffers from Chronic Diarrhœa.

Thus in no fewer than 5 out of 11 cases the possibility of another mode of conveyance than through food contaminated by flies arises. Yet the other primary cases remain unexplained, and even in the above 5 it is not unlikely that the disease was carried from one child to another by flies.

Nest No. 2. Two previous cases occur at one of the houses. With this exception, no history of direct exposure to infection from a prior case was elicited.

The preceding analysis has prepared us to conclude that both factors are at work, and co-operate to produce the final result, though, probably, in bringing about the rapid autumnal rise, the movement of flies is more potent than direct infection.

We cannot but ask ourselves why, if that be so, the extension of fatal Diarrhœa is so extremely limited.

There is reason to believe that the movements of house-flies are limited in extent, and that though they leave individual houses they do not travel very far.

The particulars germane to these nests will be shown by the following tables and maps :—

No. 1 NEST.—SANITARY DISTRICT, BESWICK.

Address	Date of Onset	Date of Death	Number of Flies	Distance from nearest Stables	Remarks
11, Malpas Street ...	Feb., 1905. Exacer- bation Aug. 6th	Aug. 20th	Tremendous at death	100ft.	Milk—Nestle's Condensed. Tuberculous family history
55 <sup>1</sup> / <sub>2</sub> Beaumont Street ...	Green Diarrhoea 4 or 5 months Pulmonary Exacer- bation about Aug. 8th	Aug. 22nd	Tremendous at death	About 90ft.	Cows—A
126, Beaumont Street...	June Exacer- bation about Aug. 9th	Aug. 23rd	Tremendous at death	Over 40ft.	Cows—B
96, Sarah Ann Street ...	June 26th	July 27th	Numerous	About 70ft.	Nestle's Condensed
124, Beaumont Street...	July 16th	July 27th	Tremendous	Over 40ft.	Cows—C
295, Ashton New Road..	July 19th	July 26th	Tremendous	Over 40ft.	Cows—D
121, Bailey Street ... (Age 5 months)	July 30th	Aug. 6th	Tremendous	About 80ft.	Breast
118, Beaumont Street...	Aug. 8th	Aug. 28th	Tremendous	About 70ft.	Barley water only, in addi- tion to breast
45, Beaumont Street ...	Aug. 8th	Sept. 22nd.	Tremendous	Within 150ft.	Handy Brand Condensed. Probably Tuberculous
11, Williams Place ...	Aug. 17th	Aug. 20th	Numerous	Within 100ft.	Nestle's Condensed
100, Sarah Ann Street...	Prior to case at 96,	Sarah Ann	Street, Mother at latter took her baby to this house		

Any infection dependent on their movements from one house to another would thus be much limited, and we should expect that they would cause limited nests of infection



To be operative at all, they must start from infected stools. They must visit these in great numbers. They must then visit the house to be infected in large numbers direct from the infected stools, or from the infected child. If their movements are further restricted to a narrow range, it is clear that the transmission of infection by them must be very local.

It must always be borne in mind that the aggregation of fatal cases represents a much denser aggregation of total cases of Diarrhœa.

I have reserved the investigation of these for another year, on account of the gaps which will be left from failure to remember the occurrences of nearly a year ago, and because of changes of tenant in the houses.

One or two points here require to be noted. The first two cases in the above table suffered from Chronic Diarrhœa, indistinguishable from that of Summer Diarrhœa. These cases stand in no social relation with the subsequent cases. The second case, which died at the age of 12 months, suffered from a cough before the Diarrhœa came on. In case 1 and case 9 there is not only a personal history indicating tubercle, but also ample material for infection in the household.

In the fifth case there was reason to suspect that the illness might possibly be Enteric Fever. The mother had Enteric Fever 18 months prior to this child's death. A baby died of (?) Typhoid 14 months before. The history of this baby's illness is consistent either with Diarrhœa or Enteric. The father died of Pneumonia on March 6th, 1905, having been ill 5 days.

The illness of the case which we are now considering was but of moderate duration, but the illnesses at the two neighbouring houses were prolonged. (Cases 3 and 8.)

As against this view is the fact that no older person is known to have had Enteric in these houses in 1905.

On the whole, it is most probable that the fatal termination in all these cases was caused by Diarrhœa, though other possibilities must always be borne in mind.

If we are right in believing that flies transmit the infection in the warm season, we can well understand that, especially in the case of young children, they will equally transmit Enteric Fever and tubercle, their power to do so being limited by the number of germs carried, the power of these to grow on the food of the child, and the dose of infection required to produce an attack. I am disposed, for reasons already given, to believe that growth of the micro-organisms on food has less to do with the transmission of infection than the quantity of infective matter carried.



Nest No. 2. The second nest is not far from the first. Particulars are, as before, set forth in the accompanying table:—

**No. 2 NEST.—SANITARY DISTRICT, BRADFORD.**

Address	Date of Onset	Date of Death	Number of Flies	Distance from nearest Stables	Milk used	Remarks
18, Nelson Street...	March 27th	March 30th	None	Within 40ft.	Cows—E	District Inspector
91, Nelson Street...	June 13th	June 15th	Not noted	?	?	District Inspector
28, Nelson Street...	June 17th	Aug. 30th	Medium number	About 40ft.	Giant Brand machine skimmed Condensed	Mr. H. Nearly opposite 43, Nelson Street, where 6 cases of Enteric Fever have occurred, beginning on Sept. 10th
7, Wellington Street	July 14th	July 16th	Tremendous	Adjoin	Nestle's Condensed	
8, Nelson Street ...	July 16th	July 22nd	Tremendous	Within 40ft.	None	Mr. Bates
32, Rhodes Street..	July 13th, 2 cases recovered; July 27th, 1 case died	Aug. 8th	Tremendous	Adjoin	Not stated	District Inspector
24, Albert Street...	July 24th, recovered	...	Tremendous	Within 200ft.	?	Mr. H.
48, Albert Street...	July 27th	Aug. 11th	Tremendous	Within 300ft.	Cows—F	Mr. H.
Same Address . (1 case)	July 30th, recovered	...	Tremendous	Within 300ft.	...	Mr. H.
14, Albert Street ...	July 27th	Aug. 1st	Tremendous	Within 200ft.	Cows—G	Mr. H.
121, Parker Street..	Sept. 9th	Sept. 23rd	Tremendous	Within 120ft.	Cows—H	Mr. H. Middens recently altered to W.C.

The annexed sketches show the position of the cases.—(See plan.)

We may sum up the principal points arrived at in the above inquiry in these terms:—

1. Epidemic Diarrhœa is probably a definite disease.

This is true, although it may often be confounded with Enteric Fever and Tuberculosis. So-called 'wasting disease' may be a form of Chronic Diarrhœa. The more prevalent true Epidemic Diarrhœa may also be mixed up with other diseases, such as paratyphoid [B], propagated by like causes, and at the same season. On the other hand, some forms of meat-poisoning, and some milk outbreaks, may belong to the more common form of Epidemic Diarrhœa.

2. It is present at all seasons in considerable amount, and, while fatal chiefly to infants and old people, it attacks freely persons of every intermediate age.

3. It is difficult to separate from diseased states known by the names of 'consumption of the bowels,' 'tabes mesenterica,' and 'wasting disease.'

4. Fatal Diarrhœa in the infant is powerfully predisposed to by previous bad health, and, especially, by affections of the digestive organs. In turn it produces 'malnutrition' and 'wasting,' even when not directly fatal.

5. Amongst the chief causes of such previous bad health are:—

The use of unsuitable foods at wrong times and in improper amounts.

Dirty and negligent habits in the mother, and dirty conditions of the home, especially in the parts of the house where the infant is placed.

The introduction of dirty and irritating materials into the system by dirty fingers, dummy teats, unclean appliances.

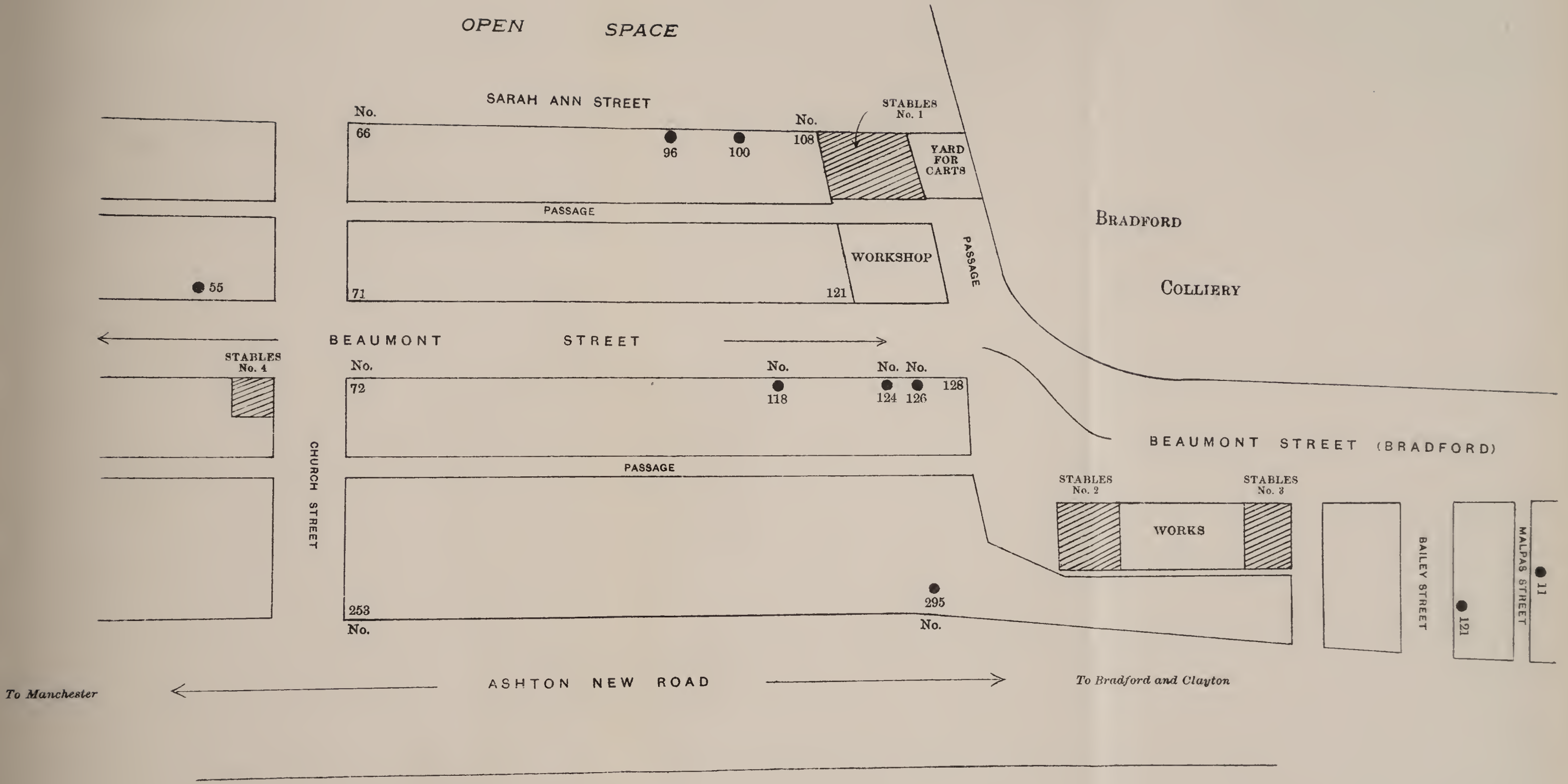
6. The presence of pail-closets and middens extends the area of infection, and contaminates food.

7. Cow's milk and condensed milks, not properly collected and stored prior to consumption, may be prevented from carrying infection by boiling, but the poisons generated in them prior to sterilisation act injuriously on nutrition and digestion, and expose the infant's system to be assailed by very small quantities of infection.

8. For this reason it is essential that cow's milk should be safeguarded at every point from milking to consumption.

9. Breast-fed infants suffer little from fatal Diarrhœa as compared with infants otherwise fed. It would not be safe to suppose that they are not exposed to, nor even that they do not contract, infection in a much higher proportion of instances than the mortality figures indicate.

NEST 1 OF FATAL DIARRHŒA.

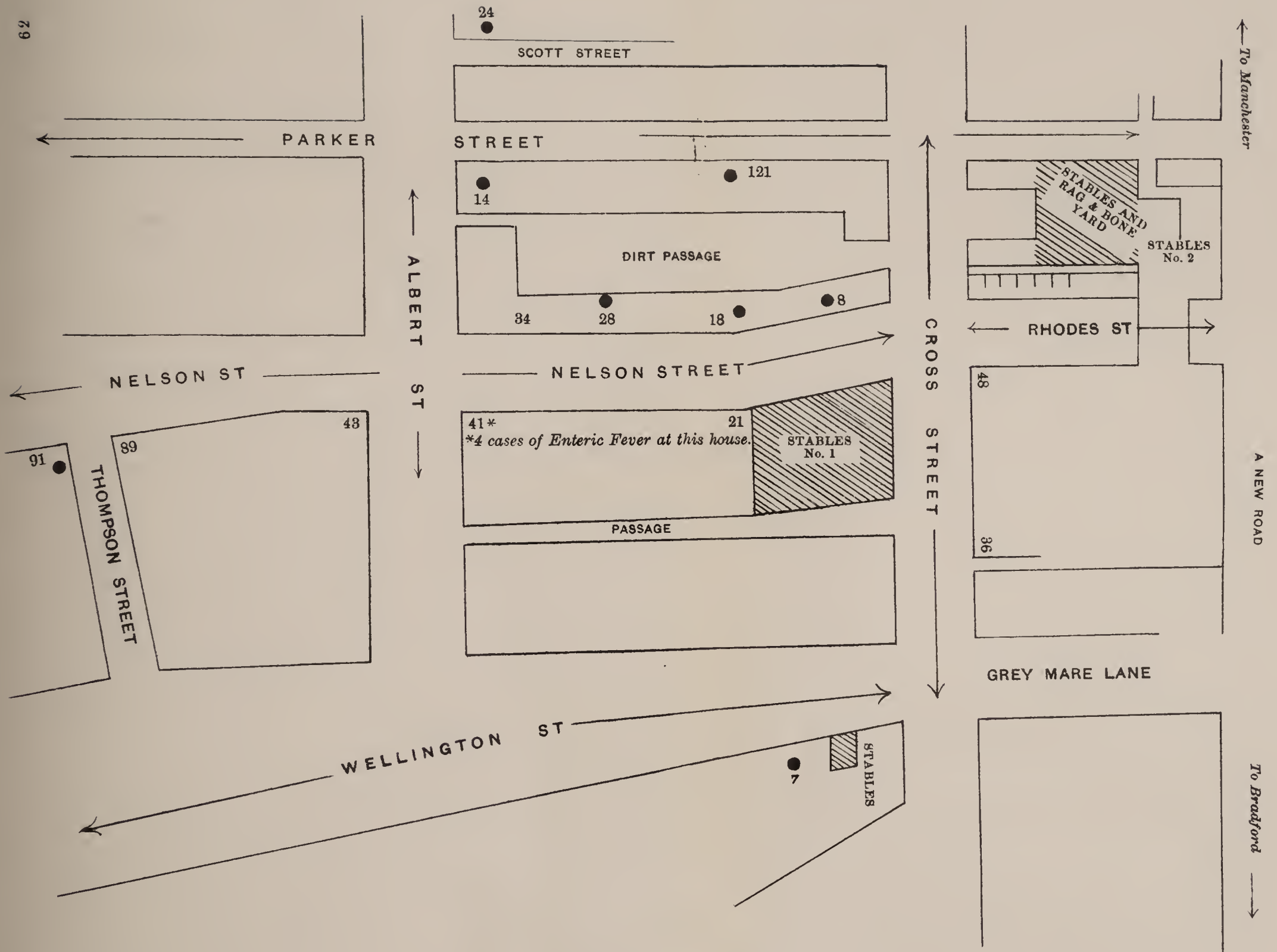






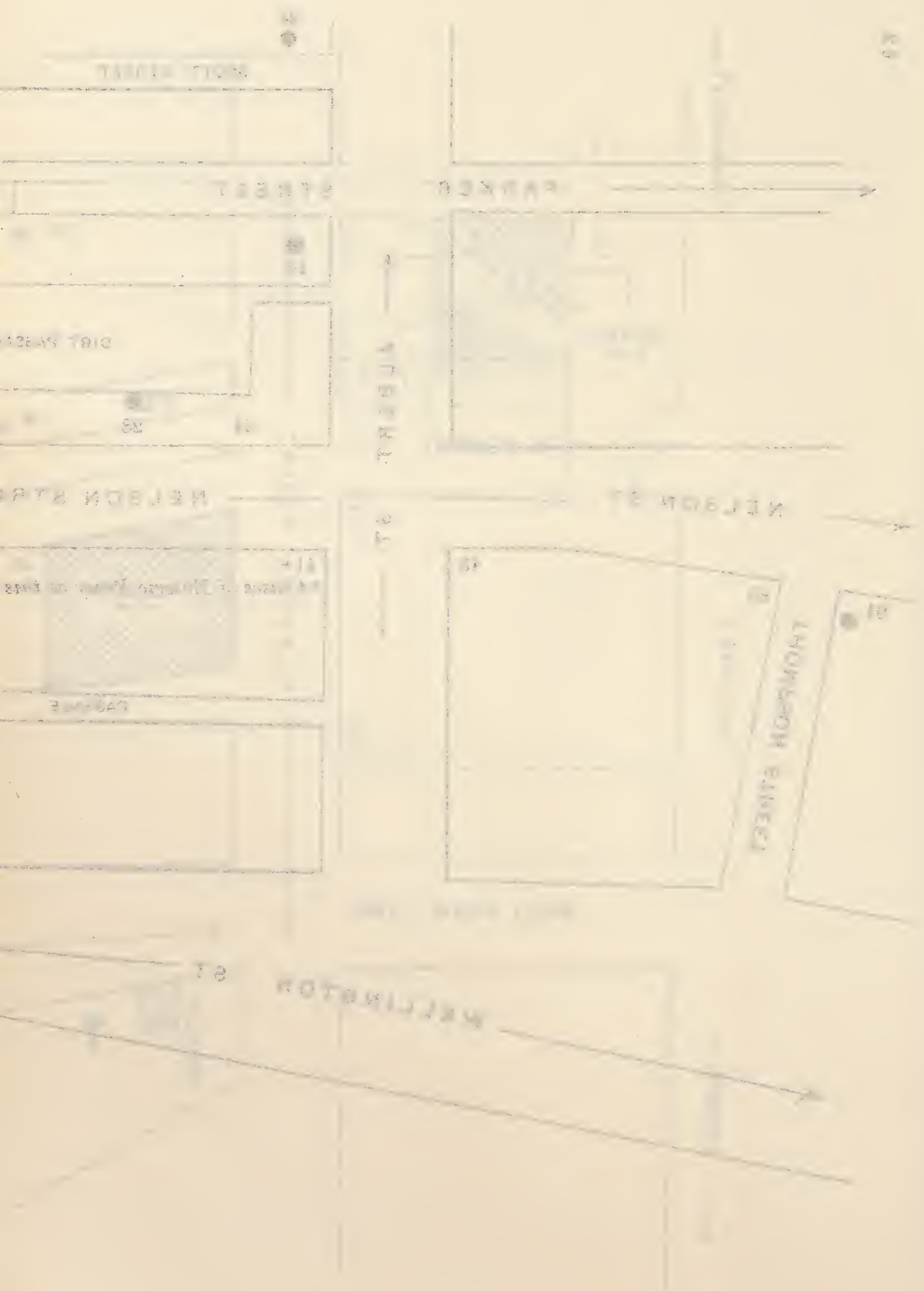
# NEST 2 OF FATAL DIARRHŒA.

● 48



# WEST 2 OF FATAL DISTANCE

200





10. Summer Diarrhœa is, at all times, propagated largely by 'direct infection,' and, outside the epidemic period, it is probable that the fatal Diarrhœa of infants is almost exclusively spread in this manner.

11. The steep rise of fatal Diarrhœa in infants in the third quarter of the year is due, in all probability, to two chief causes: conveyance of infection by flies, and direct infection.

12. We have seen how close is the parallelism between the increase in the number of flies and in the number of fatal cases of Diarrhœa, and additional facts have been given showing the probability of this mode of carriage. This factor also affects the food consumed by many persons over 12 months of age; from the child who picks up garbage in the passage, and the older children and adults who indulge in fruit, to the older people who are fond of sweets. Not only is the child's food contaminated by flies, but infection may be deposited direct on its lips.

13. Older persons suffer extensively from Diarrhœa, and often carry it home. For a consideration of the origin of fatal Diarrhœa in infants, it does not matter whether the disease is contracted by these older persons from fly-infected food, from shellfish, from other persons, or from food contaminated by previous sufferers.

The question which we have to consider is whether Diarrhœa is carried home by older persons in autumn with sufficient frequency to cause the up-rush of fatal Diarrhœa in infants. This can only be answered by a careful examination of all available histories. From those which I have collected, 'direct infection' is a factor in the increase. But the facts appear to show also that it is a minor factor, and that flies are chiefly responsible.

We may provisionally conclude that the increase of fatal infantile Diarrhœa is caused in the third quarter chiefly by movements of flies, but in part also by direct infection, and leave to another occasion the consideration how we may assign their respective shares to the two factors.

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The practical outcome of this inquiry may be stated in these terms:—

1. Renewed efforts should be made to provide a wholesome milk supply.
2. Education of girls of the poorer class in the principles of cleanliness, and in the requirements of children, is of capital importance; some knowledge of infant feeding, and of the signs of illness in infants is necessary.
3. Female teachers should receive practical training in these subjects.
4. The education which a capable staff of lady health visitors could give to poorer mothers would be of the utmost value, and should, in general,

be welcome. But the health visitors should be of a high standard of excellence.

5. All yards and passages should be kept clean, especially where houses are crowded on space. It is essential for the attainment of this object that water-closets should be substituted for pails and middens, and that passages and yards should be truly levelled, well drained, and well paved.

6. A study of the house-fly is needed, and pains should be taken to reduce the numbers produced and the numbers inside houses. To reduce the numbers outside it would be necessary to carry out the changes mentioned under (5) ; to provide horse-manure receptacles inaccessible to flies ; and to so store, as far as practicable, all collections of manure, refuse, and decaying vegetables, that they could not serve as breeding grounds for flies.

It would also be necessary to insist on cleanliness in the home, in the sense of tidiness.

7. Householders should be educated not to allow their infants to come into intimate relation with any person suffering from Diarrhœa, and to take special precautions when Diarrhœa has invaded the household.

Although Diarrhœa specially suggests the above precautions, they are applicable also in the prevention of other fatal diseases.

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## TUBERCULAR PHTHISIS.

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### GENERAL STATEMENT—PART I.

Of the various infectious diseases which the Health Authority has hitherto essayed to reduce by specific preventive measures, Tuberculosis is incomparably the most important.

On reference to the Registrar-General's Annual Report for 1904, we find that in England and Wales, out of a total of 549,784 deaths, tuberculous disease was in that year held responsible for 60,205, of which 41,852 were assigned to Phthisis. The numbers of deaths attributed in that year to a few other infectious diseases are : To Smallpox 507, to Scarlet Fever 3,770, to Diphtheria 5,763, to Enteric Fever 3,153. The numbers of deaths ascribed to other zymotic diseases are indeed greater, viz. : To Measles 12,306, to Influenza 5,694, to Whooping Cough 11,909, to Diarrhœa 29,356.

So far, however, the control which we have been able to exercise over the last-named group has been small, while Tuberculosis is eminently amenable



to preventive measures, provided there is a general desire to adopt them, and a determination to face the requisite expenditure.

While, however, deaths from the more common notifiable diseases do not in general much affect the economy of family life, the deaths from Tubercular Phthisis being, in large measure, in the fathers and mothers of families, when they ought to be in the prime of vigour and experience, entail economically an enormous loss upon the community.

It has been estimated by Dr. Nathan Raw, who has had considerable opportunities for forming an opinion, that 40 per cent. of paupers dying of Phthisis have been reduced to pauperism by the disease, independently of other causes. Assuming the correctness of this estimate, we can easily assess the immense amount of distress which is caused in the poorer families by the presence of a case of Consumption in the household, especially when the person suffering is the father and breadwinner.

From being their support and protector, he becomes a burden. Naturally, every effort is made to get him the best medical advice and the most nourishing foods. There is, not infrequently, a family of from 4 to 6 children, not one of whom has begun to earn wages, and who require care. The mother, if she can get work, may earn some 5s. or 6s. a week.

Perhaps the Guardians grant outdoor relief to the amount of 7s.

With 12s. to maintain such a family, the younger children, ill-nourished and remaining at home with their consumptive father, contract the disease, and the plague is perpetuated.

How terribly the parental period, and especially the earlier period of parentage, is overshadowed by the imminence of Phthisis will be seen from the following statement of deaths in 1904, taken from the Annual Report of the Registrar-General for 1904 :—

TOTAL DEATHS IN ENGLAND AND WALES AT SELECTED AGES FROM ALL CAUSES, AND FROM PHTHISIS.

Males.

Age groups in years..	15—19	20—	25—	35—	45—	55—64
Deaths from all causes 1904 .....	5,107	6,422	14,862	19,329	24,713	31,165
Deaths from Phthisis.	1,333	2,469	5,496	5,428	4,504	2,411



*Females.*

Age groups in years..	15—19	20—	25—	35—	45—	55—64
Deaths from all causes 1904 .....	4,917	5,832	14,112	17,125	20,603	27,982
Deaths from Phthisis.	1,739	2,138	4,554	3,655	2,328	1,264

From these figures we see how completely this disease has fastened on the years of production. At the ages 20—35, over one-third of all deaths in males are from Consumption. The proportion in women is equally high at the earlier life period 15—25. At other periods of adult life the loss from Phthisis, as compared with other causes of death, is not quite so great, but is heavier for men than for women.

These figures are typical, and repeat themselves in all communities. For Manchester, for example, in 1904 we have—

*Persons.*

Age groups in years..	15—19	20—	25—	35—	45—	55—64
Total deaths .....	203	274	649	939	1,074	1,371
Deaths from Phthisis.	74	109	236	262	210	114

Thus, more than one-third of all deaths at the ages 15 to 35 are from Phthisis, and still larger numbers die at higher ages, though the proportionate mortality is smaller.

It was, no doubt, a consideration of the sufferings entailed on families by the illness of the father or mother which inspired Dr. Hodgkinson and Dr. Shepherd Fletcher to promote the founding of a hospital for Consumption and Diseases of the Throat and Chest in this City. A brief history of the movement is given in the prospectus of a Grand Bazaar held in 1896 on behalf of the Consumption Hospital. We are there told that a public meeting was held in the Town Hall, Manchester, in February, 1875, with the above object, which immediately took shape.

“ From that year till March, 1885, the work was carried on at a private house  
 “ in St. John Street, Deansgate, there being only one consulting-room and eight  
 “ beds.

“ Towards the end of 1884, a large house and grounds at Bowdon, covering  
 “ nearly three acres, were purchased, and accommodation provided for 18  
 “ patients. In June, 1886, two large wards were opened, raising the number to 38.  
 “ The addition of a further wing has now (1896) raised the total to 50.”

“ Both these extensions, completely fitted, are a gift from the Chairman ”  
 (Mr. W. J. Crossley, M.P.).

Shortly after the acquisition of the home at Bowdon, a new out-patient department was built in Hardman Street, which in 1891 was greatly enlarged.

The out-patient department has, from an early period, served two purposes. It has served as a dispensary, such as those more recently established at Lille and Liège, in France, and on which Dr. Calmette read his well-known paper at the International Congress held in London in 1902. It has a staff of six physicians, gentlemen all highly qualified professionally, who examine and prescribe for the patients. The circumstances of the patients are inquired into, and where it is possible for them to pay for the treatment which they receive they are invited to do so, and, as a matter of fact, the sums received have been very substantial.

The out-patient department has also served as the introduction to the hospital ; suitable cases for hospital treatment being selected by the physicians.

Instruction has long been given in prevention, and somewhere about 1893, a printed paper of instructions was handed to every out-patient, containing brief but clear directions for the prevention of infection.

For a number of years, also, well devised spit-bottles have been supplied from Hardman Street at cost price.

Nor has the question of relief been overlooked. In the case of every patient admitted into Bowdon Hospital the most minute enquiries have been instituted into the circumstances of the family. It has been from an early period clearly recognised that the patients after discharge were liable to go down rapidly.

A Samaritan Fund was established at an early date. An appeal is made on behalf of this fund, for example, in the Annual Report of the Consumption Hospital for 1895, which alludes to the contributions in earlier years. The patient after discharge was then, and is now, visited by the Lady Visitor, who enquires into the circumstances of the patient. If it appears to be necessary that assistance should be afforded, it is given in kind.

The sums so expended averaged for a number of years about £120 per annum.

The future employments of patients have also engaged the attention of the Hospital Authorities, and caused them much concern.

Thus, all the elements of the problem have been present to the minds of the Committee and Physicians, and have been dealt with to a certain extent, but they have been hampered by insufficient funds for charitable purposes.

In my opinion, however, this question not only concerns the strength of a discharged patient, but profoundly affects the prevention of the disease.

A fund for the sustenance of families invaded by Phthisis might usefully be raised by the Public Authority, and distributed by some such body as the Charity Organisation Society, in cases indicated to them by the Medical Officer Health, working with the Chairman and Deputy-Chairman of the Sanitary Committee, and reporting to the Committee. At all events, it is to be said that the sums now expended for this vital need are inadequate for the purpose aimed at, and require to be greatly increased.

It is desirable that the distribution of such a fund, supposing one to be raised by any means, should be conditional, at the least, on the illness having been notified to the Medical Officer of Health, and on the carrying out of all necessary measures of precaution,

Meanwhile, members of the Council should realise the long-continued efforts of public men in this great centre of activity to deal with the problem of Tuberculous disease, even before the discovery of the tubercle bacillus by Koch in 1882, or the subsequent investigations of Cornet on house infection in 1886.

It is a fact that the movement for the establishment of hospitals and dispensaries was here anticipated and practically realised at a very early period. Nor is this statement to be taken with much qualification. In the magnitude of the dispensary operations, the out-patient department at Hardman Street will answer to Dr. Calmette's views. In one respect only, but that an important one, has Manchester not fulfilled the conditions in regard to dispensary work which Dr. Calmette considers necessary, namely, in respect of the amount of succour given to families invaded by Consumption. It is not that the need has not been abundantly recognised, but that there has not been enough money for the purpose.

In Lille the Municipality came very handsomely to Professor Calmette's assistance. It should be mentioned, however, that similar work has been carried on in Edinburgh for 20 years, work with which the name of Dr. Philip is closely associated.



The history of Preventive Public Health Work in connection with Tuberculosis, in its earlier stages in England, also belongs to this locality. In 1886, I undertook an inquiry into the infective history of a number of persons in Oldham, certified by medical practitioners to have died of Tuberculosis, and again in 1890 a second series of inquiries was undertaken.

The result was that in a considerable number of instances evidence of exposure to infection was obtained, and it was possible to lay down certain broad principles with regard to infection.

In 1887, 1888, and 1892, elementary directions for the prevention of infection were printed and distributed to every house in Oldham.

In 1886, Cornet published his work on the investigation of the dust of houses occupied by Phthisical persons, and demonstrated the high infectivity of such dust. By his enquiries into the mortality from Phthisis of the Catholic Nursing Institutions in Prussia, he showed that healthy persons placed under unfavourable conditions, and intimately exposed to infection, fall victims to Phthisis in a very high degree.

In 1892 the subject was brought before the North-Western Branch of the Society of Medical Officers of Health, and a plan of campaign was indicated, based to a considerable extent on Cornet's work. Mr. C. E. Paget was requested to prepare a memorandum of instructions in methods of prevention. In 1893, the whole subject was placed before the General Society of Medical Officers of Health, and the following principles were laid down :—

1. A memorandum on preventive measures, such as that prepared by Mr. Paget, should be sent to every house in towns.
2. Tuberculosis should be made a notifiable disease, as Scarlet Fever is.
3. Isolation hospitals should be provided by Sanitary Authorities, jointly or separately, at the expense of the rates, for the isolation of cases of Tuberculosis likely to cause infection.
4. Tuberculosis in cattle should be dealt with under the Contagious Diseases Animals Acts ; Public Health Veterinary Officers being appointed for the work.

Towards the end of 1893, a scheme of voluntary notification was adopted unanimously by the members of the Oldham Medical Society and recommended to the Town Council. This was published in the *Lancet* of November 18, 1893, and is practically identical with that adopted in New York later in the same year. The Oldham Town Council did not accept this scheme.

In 1894 I was appointed Medical Officer of Health to this City, and though the subject of the prevention of Phthisis had been considered by Professor Delépine, Dr. Ransome, and Dr. Tatham, and a commencement made in disinfection after death, it was not possible to moot such a scheme of notification as was contemplated without much discussion and preparation.

In December, 1898, a deputation from the Manchester and Salford Sanitary Association on this subject was received by the Sanitary Committee, and the late Dr. D. J. Leech, as Chairman of the Association, strongly urged the Committee to adopt the voluntary notification of Phthisis.

A scheme was prepared and laid before the Sanitary Committee early in 1899. Some delay occurred, however, but the scheme was finally placed before the Council and accepted on July 5th. The Chairman of the Committee (Alderman Walton Smith) and the late Dr. Braddon took a specially warm interest in the proposals. It should be said that though the whole scheme was placed before the Council for adoption, a special report was appended by the Sanitary Committee indicating those portions which should be at once carried into effect, and it was in this shape that it was passed.

It is thus understood that any further action taken to complete the scheme will be brought specially before the Council.

It is, therefore, desirable to note what the whole scheme provided for, and what part of it the Council adopted for immediate purposes.

The whole scheme provided (1) for a very extensive course of public instruction in preventive measures. This has been carried out, except in so far that no public lectures by medical men have been provided; (2) that application should be made to the Local Government Board to allow Phthisis to be made notifiable under the Local Act. It is now evident that the Local Government Board would not sanction so large a proposal, and the project has not been revived, as it seemed possible that to raise the question in this shape would not benefit notification; (3) that registers of names and addresses should be kept. The clerking work here provided for has proved to be of primary importance for investigation, under Mr. Lock's skilful management; (4) three Assistant Medical Officers were asked for. One was granted for starting the work under notification from Institutions, which was all that could at first be overtaken. Another was soon added when private practitioners were invited to notify.

But in the normal course of administration, to do this and some other special work in connection with infectious disease, three enquirers are really required. Then, also, it is rather monotonous for an able and ambitious man to be confined for a long time to work at Tuberculosis pure and simple. It is, in fact, necessary to give him opportunities in all departments of Public Health. For these



reasons I asked the Committee in 1903 to substitute two Sanitary Inspectors for one of the assistants. In some respects the result has been good, but I still find that an additional medical officer is needed to carry out the work which has recently been undertaken.

If it is desired to push the prevention of Diphtheria, such an appointment is, in my opinion, essential.

(4) It was pointed out that a hospital for 200 beds was needed, the idea being to isolate that number of patients who should be at all stages of the disease, choosing especially those who would be most likely to cause infection. No one who knows the circumstances of Manchester families could fail to understand that many cases who are a danger to their families and associates, and who ought to be in hospital, will not be induced to enter the Union Hospitals.

(5) Bacteriological examinations have been amply provided.

It will be seen that two lines of work have converged in this City, and have co-operated to facilitate preventive action in an unusually complete degree.

It has been believed by many that a scheme of notification would fail unless there were a hospital to which cases might be sent by the authority dealing with notification. This is not the case. But there is more in this view than I had at first supposed. Even supposing Bowdon Hospital and the Hardman Street Out-patient Department had not been in existence, it would still have been advisable to begin with a notification scheme, so that the needs of the community might be ascertained, and much useful work would have been done in the way of instruction.

But it has to be remembered that to sustain household visits, month after month, perhaps for years, becomes rather trying, and demands great tact and management from the visitor, as well as judgment on the part of the person visited.

The possibility of hospital treatment under these circumstances, even if it is not accepted, is a great assistance to the Public Health Office.

In the beginning of 1904 the Delamere Sanatorium—Mr. Crossley's magnificent gift to the district—was opened for the reception of patients, and the Corporation have been fortunate in getting 20 beds assigned to them in connection with their notification scheme.

In order that the utmost advantage might be derived from this scheme, the Hospitals Sub-Committee instructed the Medical Officer of Health that the patients admitted must fulfil the following conditions, and that the circum-



stances of all cases admitted should be specially reported to the Sub-Committee :—

*Conditions of Admission of Corporation Patients to the Delamere Sanatorium.*

1. The patient must have been notified to the Medical Officer of Health under the scheme of voluntary notification of Phthisis.
2. The patient must be in the early stage of the disease, but already infective, as shown by the presence of tubercle bacilli in the sputum.
3. The physicians of the Consumption Hospital must be satisfied that the case is suitable for admission to the Sanatorium, in regard to the stage which the disease has reached.
4. The patient must come from a crowded house, or must in some way be decidedly dangerous to the household.

At the time of writing this report these beds are all occupied, and pressure is felt from applicants.

During the whole of 1905 part of the cottages attached to Clayton Hospital were occupied by men, and during the latter part of the year the remainder were occupied by women. Thus, in all, 32 beds are in occupation. These patients are, for the most part, advanced cases, and it is surprising how well they usually do, for a time. An account of these operations will be given separately.

It seems desirable that the Council should be aware of the provision now made for the treatment of Consumptives in Manchester, it being understood that, except in the case of the Delamere and Bowdon Sanatoria, all the cases are admitted from the City. An account is therefore given below :—

Manchester is supplied with Consumption Hospitals as follows :—

- (1) The Crossley Sanatorium at Delamere Forest, Cheshire, contains 100 beds, 20 of which are retained for this City for Manchester patients who are notified to us under our Voluntary Notification Scheme, and who fulfil the conditions stated above. At this sanatorium only early cases are accepted.

It will be understood that the private and charitable cases also come from Manchester and district.

The building and furnishing of the Delamere Sanatorium are understood to have cost £70,000.

The cost of maintenance at the several Sanatoria is estimated at £1 per week for each bed. The Corporation pays at this rate for its 20 beds at Delamere.

(2) The Bowdon Sanatorium at Bowdon, Cheshire, containing 50 beds. For the most part, only cases in the early stage are accepted here. This hospital is also for Manchester and district.

(3) Mr. Crossley has also provided 25 beds at the Sunnyside Home at Openshaw (a suburb of Manchester) for advanced and bed-ridden cases.

(4) The Corporation has opened cottage wards at Clayton Vale Hospital (the Smallpox Hospital) for Consumptives. There are about 16 beds for men and the same number for women, and these have both been filled for nearly a year. This experiment was begun in 1901, but was interrupted in 1902 by the occurrence of Smallpox, and was resumed in 1904, 16 beds being at first provided for men only. The cost of maintenance is enhanced slightly by the fewness of the patients.

(5) There are three Workhouses, all of which have separate wards for their Phthisical cases. They are as follows :—

(1) Manchester Workhouse for Manchester Township only:

<i>Male.</i>	Number of beds.
Three wards with 31 beds each for advanced cases .. ..	93
One ward for early cases .. .. .	24
<i>Female.</i>	
Two wards with 31 beds each for advanced cases .. ..	63
One ward for early cases .. .. .	24
<hr/>	
Total number of beds .. .. .	204

The average number of Phthisical cases in this workhouse is about 180.

(2) Chorlton Union Workhouse for South Manchester and district:

	Number of beds.
Three male wards with 32 beds each .. .. .	96
One female ward with 33 beds .. .. .	33
<hr/>	
	129

In both the above-mentioned Institutions, occasionally, in the winter months, when there is a large influx of such cases, a few are put in the general wards.

(3) Prestwich Union Workhouse for North Manchester and district:

There are here 6 beds for male and 6 for female patients, about half the number being usually occupied.

The numbers notified to us from the Workhouses have been :—

Year	Number notified									
1900	..	..	..	..	..	..	..	..	..	578
1901	..	..	..	..	..	..	..	..	..	625
1902	..	..	..	..	..	..	..	..	..	667
1903	..	..	..	..	..	..	..	..	..	556
1904	..	..	..	..	..	..	..	..	..	512
1905	..	..	..	..	..	..	..	..	..	527

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The greatest need is a Hospital for cases in a moderately advanced stage of the disease who are not paupers, or who, in any case, will not go to the Union Hospital.

I would again emphasise the great aid to the notification scheme which would accrue if more patients were treated in association with it.

So fully is this realised by the authorities of the Consumption Hospitals (Delamere Sanatorium, Bowdon Sanatorium, Hardman Street) that all cases coming within their knowledge are notified to the Public Health Office. They appreciate, I hope and believe, our assistance as much as we appreciate theirs, and I would here acknowledge my obligation to the Secretary (Mr. Hunt) for assistance generally, and for the above particulars on the origin of the Consumption Hospitals.

The assistance which we are able to give in the attainment of our common object is the systematic education of patients and of their friends in the preventive action which should be taken, and the disinfection which we carry out. If Consumptives in Manchester do not take all necessary precautions, it is not for want of teaching. They are systematically taught at the Consumption Out-patient Department, and again they are under strict rules when admitted into the Sanatoria. All notified cases are systematically instructed by us at their own houses, and receive materials into which they can expectorate at home, a bottle to spit into when out, and sheets of tissue paper to cough into. If admitted into Clayton, they are again instructed in the precautions needful, both practically and verbally. Printed directions are also posted in the rooms. Printed directions are supplied with the pocket spittoons supplied from the Public Health Office, as follows :—

*Directions for the use of the pocket spittoons.*

1. Carry the spittoon in a waistcoat or other suitable pocket, with the larger end up.
2. To use the spittoon, unscrew the larger metal top, and in spitting see that nothing adheres to the sides.



3. The contents must be disinfected daily. For this purpose a small saucepan must be employed, which should not be put to any other use.

4. To disinfect the spittoon, pour cold water into the saucepan sufficient to cover the spit bottle. Unscrew the caps, and place the spit bottle with its contents, as well as the caps, in the saucepan.

Raise the saucepan to the boil slowly, and keep it boiling for a quarter of an hour. Then put it aside to cool.

5. The spit bottle may then be rinsed out into the saucepan with cold water or cold water and soda, and the caps also washed over and screwed on, when the bottle will be ready for use. The contents of the saucepan may then be poured into the sewer.

6. Please note that unless heating is carried out carefully as above the bottle will break.

7. Expecterated matter may be disinfected in other ways, as by allowing a 20 per cent. solution of carbolic acid to stand for some hours in contact with the expectorations in the bottle, but the plan given above is both cheapest and best.

8. The spit bottle is to be used by the consumptive when at home instead of a pocket-handkerchief, as well as when away from home.

Soft clean paper or a clean rag may be used at home, but must be immediately burned.

The paper used in wiping the lips must also be burned at the earliest possible opportunity.

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In view of the provision made for the treatment of Consumptive patients in the Sanatoria at Bowdon and Delamere, it is perhaps well to state that the cases which would be treated in a Corporation Sanatorium would be a few early cases, for whom room could not be found in the Delamere and Bowdon Sanatoria, and the large number of advanced Consumptives, in an infectious stage, who are not suitable for the Union Hospitals, or will not enter them. Many of these would be able to pay towards their maintenance, and in that case should be made to do so in proportion to their ability. It is on these people, and on their families, that the stress of Phthisis falls with peculiar severity. There is no provision at present for these highly infectious cases, which is within their means.

The question has been raised whether sickness should be associated at all with pauperism. There can, in any case, be little doubt that cases of Phthisis should not be treated in Union Hospitals, but in a separate Home or Sanatorium preferably, under the management of the Sanitary Authority.

If it be not desired to take the poorest class of Consumptives away from the care of the Guardians, they should be received into a hospital entirely removed from the Union.

But this question does not affect the need for a home for the class of cases whom I have mentioned above, except in so far as it would be cheaper to the community to have all cases received into one great hospital.

It is difficult to estimate the number of well-marked cases of Consumption in the City. The number notified in 1905 was over 1,400. If we were to judge from the proportion of notified cases who appear in the death registers, we should have to add an equal number to the above 1,400 to get a total. That is to say, there may be 3,000 cases of Phthisis in the City. But the basis of calculation is an uncertain one, and 2,000 may be nearer the mark. In any case, the numbers are not beyond the power of the City to cope with successfully. The number of notifications received from the Union Hospitals last year was 527. 46 patients were under treatment at Clayton. The number admitted to Delamere and Bowdon from Manchester during 1905 was 214. Of the remaining large number, a few would doubtless be in general hospitals, but the above figures give nearly the whole. Taking 2,200 as the residue, it may be confidently stated that a very large number cannot be properly treated at home, and are unable to work. A hospital for 200 beds would go far to meet this need, and 100 beds would do most valuable work in the prevention of the disease.

Two difficulties which up to the present time have been very imperfectly dealt with are these :—

(1) Supposing a patient to have been treated in a Sanatorium for a sufficient length of time, almost to cure him—it is not usual to find all trace of the disease eradicated—what is he to do when he leaves the Sanatorium ?

If he resumes his former occupation, which often is beyond his strength, and not infrequently is directly injurious, he goes back rapidly.

He is, no doubt, instructed in precautionary measures. But his home is crowded or ill-ventilated ; he is not always on his guard when assailed by coughing fits ; his strength is drained in various ways ; he loses ground, perhaps, by indulgence in the consumption of beer or spirits.

The problem of the discharged consumptive is by no means an easy one.

It is sometimes astonishing how rapidly patients, especially men, go down.

It is essential that he should receive adequate nourishment on his return home, and assistance is usually necessary that this may be possible.

Part of the same difficulty is to find employment suited to his strength and condition for the discharged patient. The efforts hitherto made in this direction do not appear to have been very successful.

It is, indeed, a question whether it would not be better, failing a cure, to detain patients, allowing them to return home for a few days at intervals, rather than to have them going down hill rapidly after discharge. Cases advancing to a cure should be detained until it is complete. It is, no doubt, exceedingly difficult to induce patients to remain in hospital. But that is an administrative difficulty which could be overcome.

Occupation might be found for a number of the patients in dairying, market gardening, poultry keeping, and in connection with other needs of the Institution. Possibly a school might grow up in which small cultures of this kind might be taught in such a manner that the patient might learn how to make a living away from the hospital. To render this proceeding valuable, very special instruction would be requisite both in the matters taught and in the application of economical methods. If, however, the subject were taken up with a determination to succeed, an outlet seems possible in this direction.

(2) The second difficulty is to secure adequate support for his wife and family while the breadwinner is disabled. If we are to arrest Tuberculosis within a reasonable period, this will have to be considered. Privation powerfully assists the progress of tubercular infection.

We may conclude these preliminary observations with a review of the results of our work. The death-rate from Phthisis could not be expected to be much influenced by the working of the Notification Scheme prior to 1903, since it only entered into full operation in 1900, and the average duration of illness in the artisan class approaches 3 years. The death-rates from Phthisis arranged in groups of 3 years per 100,000 inhabitants run as follows :—

1894.....1·97	1897.....2·12	1900.....2·09	1903.....1·85
1895.....2·16	1898.....1·95	1901.....2·09	1904.....1·98
1896.....2·00	1899.....2·05	1902.....2·08	1905.....1·68
Average..2·04	2·07	2·09	1·84

It is true 1905 was a year favourable to chest diseases generally. Still it does really appear as if a step forward had been taken in the prevention of Phthisis. Certainly the drop in 1905 is very striking. If the improvement



shown in the above figures is real and permanent, to what is it due? It cannot be due to hospital treatment, since no change has occurred which would account for it. The beneficial influence of the Delamere Sanatorium has not yet had time to assert itself.

Nor do I know of any cause other than the efforts which have been made to instruct the community and to remove house infection adequate to account for so great an alteration during the last three years. Provisionally, we may claim a considerable share in the result for the working of the Notification Scheme.

To recapitulate the requirements which appear to be needful for further marked advance :—

1. The hospital for cases not in the early stage of Phthisis, provided for in the scheme adopted by the Council in 1899, should now be seriously considered. Economically the expenditure could be justified. It would be incurred to save from infection people at working ages whose value to the community would be considerable. Incidentally, many cases would recover a working value.

2. A fund is required from which assistance would be rendered to households in which the breadwinner is struck down with Phthisis but the children are too young to earn wages. Or, at all events, special provision should be made in such cases to see that the children are well tended and well nourished, so as to reduce the risk of infection. This fund should be administered in connection with the Notification Scheme.

#### DETAILS WITH REGARD TO THE NOTIFICATION SCHEME—PART II.

The object of the Notification Scheme was to get access to individual cases of Phthisis, and thus to be able directly to impart instruction, and to take such other action as might help to protect the family and others coming into contact with the Phthisical person.

With this view it was believed to be necessary to extend the previous observations which had been made as to the sources of the illness, and to ascertain, as far as possible, the various ways in which the disease had been acquired.

No one could make such inquiries without considerable practice and study of previous work. The first medical officers appointed had, necessarily, to acquire the experience and aptitude for this work. This preliminary difficulty having been overcome, it was comparatively easy for subsequent enquirers, after study of the results arrived at by their predecessors, to see in what various directions they must look.

It was possible, however, at the outset, by framing a comprehensive form of inquiry, to assist the beginner in this line of work. Such a form was accordingly drawn up, and remains substantially unchanged, as it was found that almost every question was requisite for administrative purposes.

In this form is entered the name and address of the case reported, with sex and age, the name of the reporter, or of the institution from which the case is reported. The Special Enquirer visits and enters a number of particulars with regard to the sanitary condition of the house.

The length of illness is ascertained, and how long he has lived in the present house. Should it appear that his illness has been contracted in another house, the former addresses are ascertained, and how long the patient has lived in them. The condition of such of these houses as may have been occupied at the time of invasion is enquired into, and enquiries are made as to their previous occupation by consumptive persons.

The ages of each member of the family are recorded.

Inquiries are made as to any members of the family who have been Consumptive, and dates are given.

Particulars are ascertained of any present illness in the family.

Particulars as to the physique of the remaining members of the family are recorded.

Question 17 enquires into intimacy or association with a Consumptive for some years before attack, and such persons are classified as (*a*) a member of the family, (*b*) a relative, (*c*) a companion, (*d*) a workfellow.

It is the answer to this question which tries the ingenuity and skill of the enquirer.

The workplaces and the character of the work are next inquired into, and to this question is attached by Mr. Lock the history of the individual workshop as regards Consumption. Workshop includes school.

The personal physique of the patient, his exposure to injury at a period preceding his illness, his personal habits, are then inquired into. On these depend his facility of attack. If, for example, a strong man is attacked with Consumption, and no clear source of his attack is ascertained, it may be assumed that the enquirer has failed to elicit important facts. Moreover, these questions bear intimately, in many cases, on the origin of the illness.

Where the history indicates Consumption of the Bowels at the commencement of the attack, inquiries are made as to the milk supply.

The precautions which the patient has hitherto taken are then entered.



A question is entered as to materials supplied (in the shape of spit-box, spit-bottle, or papers to cough into).

An enquiry as to personal instruction, and as to instructions to the householder is filled in, and two or three other questions less frequently answered complete the paper.

The condition of the patient as regards his power to get about, and to work, is given. At the conclusion of the form are placed, at present, details of disinfection, and a brief history of the illness. It will be seen that, in so far as these have been carefully filled in, there are abundant materials for judging of the factors concerned in the patient's illness, and for building up materials for administrative guidance.

When the patient and his household have been instructed in the precautions to be taken, and disinfection has been carried out, it is assumed that, in the future, there should be little infection in the household.

But this assumption often cannot be made, and the household is, therefore, visited once a month, in the more outlying parts of the City by the Sanitary Inspectors, and in the Central parts by the Health Visitors of the Ladies' Public Health Society, who are expected to see that the necessary cleanliness is maintained, and that the precautions enjoined are observed.

There has, however, been little supervision of this part of the work.

Every three months the householder is expected to see that the rooms occupied by the Consumptive are cleansed, the floors being scrubbed with soap and water, and the walls cleaned with dough. It is believed that this part of the work is fairly well performed.

Needless to say, serious sanitary defects in the houses are referred to the Sanitary Department, and are made good.

We may, first, consider what use is made of the enquiry forms.

All cases, past and present, are arranged—

(1.) In name index cards. By means of these, previous notifications, changes of address, and the history of any given person can be at once ascertained.

(2.) In address index cards. By means of these the history of localities, down to streets and individual houses, are given from 1898 onwards. Deaths are included in both sets of cards, whether the cases have been previously notified or not.

(3.) A card index of occupations enables us to look up the history as regards notified cases of Phthisis, since 1899, of every workshop in the City.



This orderly arrangement of so many facts involves a great deal of work, but, in return, any set of circumstances coming within the scope of our inquiries can be readily investigated. Thus, we are in a position to give a great many facts bearing on infection in those streets in which Phthisis appears to spread from house to house.

In the investigation of the injurious influences at work in particular occupations, the card index of occupations is absolutely indispensable.

The circumstances of each household are recorded in cases attending the Hardman Street Hospital in the Hospital books, and, though the actual earnings have not been so far recorded in our investigations, the age and sex of each member of families invaded are entered for every case, information which is, for our purpose, practically equivalent in the great majority of instances.

I have requested Mr. Lock to furnish me with details in regard to the routine of the disinfecting work, which has been so arranged as to effect as much in the way of disinfection as practicable, with the minimum of disturbance.

It cannot be said that the disinfection of articles has been adequately secured, but house disinfection has been very fairly carried out.

The following is an account, prepared by Mr. Lock, of one portion of the work carried on from the Tuberculosis Office, which, it is believed, will be of general interest, viz., the procedures of Cleansing and Disinfection:—

#### I.—*In connection with Notified Cases.*

Whenever possible, the Phthisis Visitor enters upon the Investigation Form full particulars of the cleansing and disinfection required, and indicates whether this must be done by the Corporation, or whether the tenant is able and willing to do it under the direction of the District Sanitary Inspector, or, in districts which are included in their operations, by the Female Health Visitors.

1. (a) When to be done by the Corporation, and the house is in a dirty condition:

A letter is sent to the owner, asking for his consent to the stripping of dirty paper and to the washing of the remainder with a disinfecting solution. When an affirmative reply is received, exact particulars of the work to be done are entered upon a "Cleansing Form" (Form 2). These particulars are telephoned to the Disinfecting Station, and the form is then passed on to the Sanitary Inspector or Female Health Visitor for the district, who supervises the work, fills in on the form the times of arrival and departure of the disinfectors, and returns the signed form to the office.

- (b) When to be done by the Corporation and the house is in a clean but dusty condition, or when the patient has been ill in the house for a considerable period and there is little dust visible :

In such a case, the tenant having consented, the papered walls are cleaned with dough (Esmarch's method), and the unpapered walls, the floors, skirtings, ceilings, furniture, etc., are washed with solution of chlorinated lime of guaranteed strength and quality. Such particulars are entered on Form 2, and telephoned to the department, the rest of the procedure being as under (a).

- (c) When the Phthisis Visitor finds the house empty :

A letter is sent to the landlord asking permission for the Corporation to cleanse the house before he rebeautifies it. If he intends to rebeautify, we proceed, with his consent, as described under (a). If he is not going to redecorate the house, we proceed as under (b). Should it be his intention, however, to repaper certain rooms only, the remaining papered walls being fairly clean, we strip the former and proceed as under (b) as regards the remainder.

In all cases a copy of Form 3 is attached to the Form 2 above-mentioned. Form 2 is one which contains a description of work to be done. Form 3 is one on which is described all the cleansing that is actually carried out, whether by the Corporation or by the tenant, or by both. It makes reference to the rooms cleansed ; to the manner in which this is carried out ; to the disinfection of bedding, clothing, carpets, rugs, curtains, etc. ; to the washing of personal clothing of the patient ; and to the cleaning of furniture. Upon this form in every case the Inspector or Female Health Visitor is expected to give a full and particular report of the cleansing and disinfection carried out.

2. When the cleansing is to be done by the tenant :

A copy of Form 3 is in such a case handed to the Sanitary Inspector or Health Visitor, who is expected to get the papered walls rubbed with dough, all painted surfaces, floors, furniture, etc., washed with soap and warm water, and the patient's clothing either disinfected at the Oldham Road yard or scalded with boiling water and washed. When the work is completed, the form is dated, signed, and sent back to the office.

3. In connection with the periodical visiting :

When a monthly visit is due to the house of a patient who is being nursed at home, a Monthly Report Form is prepared by the entry upon it of the patient's name and address, with the number of the case



and the date of issue. This form is passed on to the visitor, who calls at the house, enquires whether and what precautions are being carried out, enters the particulars upon the form, and returns it to the office.

It may happen that the visitor finds that the patient has left the house, or has been removed to hospital, or that the house is empty. We then proceed as under 1 or 2, as the circumstances may require.

When a quarterly cleaning is to be carried out where a patient is being nursed at home, a copy of Form 3 is prepared. In this case the name, address, and other particulars are entered upon the forms in red ink, so that they may be instantly distinguished from those issued under other circumstances. The usual procedure is then as under 2. It occasionally occurs, however, that the tenant for some special reason is unable to do the work, as where all the occupants of the house work out and cannot afford to "lose time," or where those remaining at home are too feeble to cleanse the house. In such cases the Corporation disinfectors are sent to carry out the work according to the requirements of the case—the District Inspector or Female Health Visitor indicating the exact measures of disinfection necessary.

## II.—*After deaths of cases that have not been notified.*

In such cases nothing is known to us of the circumstances or of the condition of the house in which the death has occurred. We therefore enter the name, address, date of death, etc., upon Form 1. This is handed to the District Sanitary Inspector, and upon it he reports whether the house is dirty; whether it must be disinfected by the Corporation or may be cleaned by the tenant; the particulars of the cleansing required; the landlord's name and address; if empty, where the key may be obtained; the patient's previous addresses, occupation, and place of work during the last 3 years; and any sanitary defects. With this information for reference, we are able to proceed in any manner that may be necessary.

[The same form is used also in notified cases where a patient is notified as having entered hospital from a *new address* after having previously been lost sight of. It is also used for reporting the condition of a house that a patient may recently have vacated, when he is visited for the first time.]

All forms containing reports from the Sanitary Inspectors and Female Health Visitors are carefully examined, and, when done with for the time, are dated, numbered, filed, and indexed, so as to be available for subsequent reference.



These various operations necessitate the careful keeping of a Business Book, in which are entered the address of the house to be cleansed, the reason for the cleansing, the forms issued and date of issue, the date on which the landlord is written to, the date of his reply, whether the work is to be done by the Corporation or by the tenant, the date of cleansing, the date of the removal of clothing for disinfection, the date on which the report of the completion of the work is made, the cost when done by the Corporation, and remarks that may be necessary.

The forms made out for the monthly visits and the ordinary quarterly cleanings, however, when issued are entered in the Visiting Lists, and the date of the visit or cleaning is carefully recorded before the forms are filed. In this way a glance serves to show exactly when any house on the 45 lists has been visited or cleaned ; while a reference to the file will show what work was done and by whom it was carried out.

As, since the commencement of operations in September, 1899, to the end of 1905, 6,528 houses were cleansed and disinfected by the Corporation, and 11,412 cleansings were carried out by tenants, and as this work can be efficiently and regularly done only in conjunction with careful keeping of records, it will be seen that a considerable amount of clerical work is involved.

*(End of Mr. Lock's Statement.)*

Then, again, the monthly reports of the Sanitary Inspectors and of the Health Visitors are scrutinised, supervised, and filed. If these reports can be absolutely relied upon they will give an excellent idea, not merely of the precautions maintained, but of the health of the phthisical case at any time subsequent to notification.

It was at first intended that the work done in connection with cases of Phthisis should be extended to families in which persons had died of Phthisis. This has not been possible, and would require a considerable amount of tact. Nevertheless, it was in connection with such enquiries that all the early work on this subject was done.

It has been considered necessary to have a considerable number of bacteriological examinations of sputum made. These give valuable information as to the infective condition of individual cases, as to the need for special instructions, and as to the suitability of patients for treatment in hospital from a preventive point of view.

In connection with the Notification Scheme, handbills, giving advice as to preventive action, were distributed by the courtesy of the Watch Committee to every house in the City in the year 1894 and again in 1903 by the Boys' Messenger Brigade.

Cardboard notices in reference to spitting have, by the courtesy of the Watch Committee, been placed in every living and sleeping room in the common lodging houses of the City, with the result that expectoration has greatly diminished. This effect was, no doubt, aided by frequent disinfection in the case of those offending most seriously in the first instance. But this has been intermitted for a considerable time, and the improvement appears, on the whole, to continue. Similar action has been taken in the majority of factories and workshops in which cases of Phthisis have occurred, also with good results.

It would also appear that the bye-law adopted by the Council in March, 1904, forbidding expectoration in public places, has been beneficial. At all events, there is less expectoration noticeable in tramcars.

In public-houses, however, we have not succeeded in producing much change, the notices which were at one time suspended having soon disappeared.

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In connection with the Notification Scheme, some investigations which have been instituted deserve special notice.

The first of these was an investigation conducted by Dr. Harold Coates, the first assistant appointed, into the infective character of the dust in rooms occupied by Consumptives. Cornet's investigations did not appear to have been controlled to an adequate extent, and as our procedures were founded on his results, it appeared necessary to confirm them.

This investigation was carried out under Professor Delépine's guidance, and with his assistance, and was conducted by Dr. Coates with conspicuous care and ability.

The results may be thus stated :—

The same care having been exercised as in Cornet's experiments to ascertain that the dust investigated came from places not directly accessible to expectoration, specimens of dust were collected :

(1.) From 23 houses in a dirty condition, and in which a Consumptive patient was living, who was taking no precautions to dispose of his expectoration so as to prevent infection of the atmosphere, but who spits freely on the floor, or into his pocket handkerchief, etc. Of these, two gave inconclusive results, while of the remaining 21 samples of dust 14 were infective.

(2.) From 10 houses in a very clean condition, according to ordinary standards, but in which a Consumptive patient was living, who was not sufficiently careful in the disposal of his sputa. Of the 10 samples of dust, 5 were infective.

(3.) From 10 very dirty houses, in which there had been no case of Tuberculosis for some years. None of these samples were infective.



Experiments were also made which showed that the method of disinfecting surfaces recommended by Professor Delépine, viz., washing with a weak solution of chlorinated lime, was completely efficient when applied to paper on which sputum, highly charged with tubercle bacilli, had been dried.

The corresponding surfaces, not washed with chlorinated lime, were shown to be infective.

Where expectoration could be shown not to have been deposited on surfaces, Esmarch's method of cleansing with dough was accepted in lieu of washing with chlorinated lime.

In 1902, Dr. James Beatty carried out an elaborate inquiry into the history of Consumptive houses after disinfection, and showed that, so far as the material then accumulated admitted of a conclusion, the disinfection of houses had in reality been of service in limiting the extension of Tuberculosis.

In 1903, Dr. James M. Cowie instituted an inquiry into the influence of school life in the spread of Consumption, as the result of which he concluded that some schools do assist in a limited degree to propagate Phthisis, but that the numbers infected at schools are probably few in number. No doubt, the attention thus directed to the less sanitary schools will be useful.

In 1902, with the assistance of Dr. Beatty and Dr. Cowie, and with the aid of the well-arranged materials collected in the office, I instituted an inquiry into the influence of occupations in Manchester. This inquiry was, however, based largely on the use of statistical materials from the report on occupations to the Registrar-General prepared by Dr. John Tatham. We also made personal inspection of a number of works.

The results may be thus stated :—

Great part of the mortality in many occupations has, probably, little connection with the occupation itself, directly at all events.

Men suffer more than women when engaged in the same class of work.

The chief differences are that men expectorate more than women on the floors of workrooms, and that they frequent public-houses to a greater extent.

Publicans and their servants sustain a high mortality from Phthisis.

There is a very great amount of expectoration going on in public-houses, especially in those in the more central parts of the town.



In the case of one workshop especially, it appeared possible to connect the considerable number of cases occurring in the workshop with the frequenting of public-houses used also by persons residing in common lodging houses, while the work itself appeared to afford no explanation of the facts.

The conclusion was drawn that public-houses, especially in certain quarters of the City, must be regarded as active forces in the spread of Tuberculosis.

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In successive Annual Reports, moreover, the individual inquiries have been analysed, and examples have been given illustrating the numerous occasions in which persons appeared to have been infected by contact with previous cases at home, by intimacy with Consumptive relatives, from workmates, from companions, and so forth.

In many cases more than one possible source of the disease presented itself.

The following rules reached by a study of cases investigated have been used, not as absolute guides, but as giving help in checking hasty conclusions.

Healthy people do not contract Consumption except on intimate, and usually on prolonged exposure to some well-marked source of infection.

The most common period between infection and the commencement of symptoms is, in the case of Phthisis about a year.

The most common period between exposure to infection and death is between two and three years, and nearer to the latter than the former period.

This last conclusion is the one which Cornet deduced from his investigation into the mortality of novitiates in the Catholic Nursing Institutions of Prussia. From each of the inquiries instituted at Oldham in 1886 and 1890, it was deduced that the period was between two and three years.

We are now in a position to arrive at results from more extended inquiry. Mr. Lock has recently taken the average period for 500 cases, and finds that it is 2.9 years.

The average length of illness prior to our first visit to these cases was 2.4 years. The average length of illness after the first visit was 6½ months.

The concordance of these results, and, in especial, their agreement with the observed course of events in the Catholic Nursing Institutions of Prussia, affords a considerable measure of probability that the probable sources of the disease ascertained were in reality, in most instances, the real origin of the attacks—a point of cardinal importance.

The infective history of occupations is also given in successive Annual Reports since 1899. It was dealt with by Dr. James Beatty in a very complete manner in the Report for 1901. In this article he collected and enlarged upon the materials which his predecessors had brought together.

The classes of workers principally considered were warehousemen, ironworkers, printers, dyers, dressmakers, etc., office cleaners, washerwomen, workers in connection with railway carriages, house decorators, clerks, tailors, rubber workers, etc.

These materials have since been greatly extended, and it has been possible to draw positive conclusions regarding certain works which have received special attention.

In this connection I would express my obligation to His Majesty's Inspector of Factories and Workshops for the facilities which he has given in visiting works.

### PART 3.—HOSPITAL TREATMENT.

It has been already mentioned that 45 cases of Phthisis were received into the cottages at Clayton Hospital during 1905. The great majority of these were advanced cases, and it was not to be expected that the patients would be cured.

Indeed, but for the experience of 1901-1902, and a knowledge of the results obtained at Mr. Crossley's Home of Peace, one would have expected that the patients would many of them rapidly become worse, and die.

Such was, in fact, the case with a few of them. Others again did well. The majority gained weight. But as regards the condition of the lungs, in the greater number there was no real improvement. The results may be thus exhibited :—

Much improved in every way	Gained weight considerably. Lungs as before, or but little improved	Stationary or lost ground	Died
12	17	8	8

It is, however, difficult to convey adequately an idea of the progress of the patients on the above lines, and I have, therefore, given a brief summary of each case admitted in 1905 up to May 15th, 1906.

If we consider the position of Clayton Hospital in an enclosed valley, close to the Medlock, and a quarter of a mile from a tip, we must regard the results attained as remarkably good.

It would be idle to maintain that in such a situation the patients will do as well as they would in a perfectly pure atmosphere. Yet, unless the atmosphere is decidedly dusty or grimy, my view is, as it has long been, that it is not a major factor in the result.

Given complete rest, good food, good cooking, and a pleasant home, excellent results may, in my opinion, be obtained in any part of Manchester.

It is, however, requisite that the conditions mentioned be absolutely fulfilled. Worry or agitation is most adverse to improvement. The appetite of the Phthisical patient is well-known to be extremely capricious, and difficult to humour, and to get the best results it is necessary to study, and as far as possible satisfy, the wishes of each patient. There must also be complete harmony in the home or hospital.

All this has to be maintained side by side with strict discipline.

Undoubtedly, the fact that Dr. Forbes had the care of the patients at Clayton Hospital had much to do with the improvement shown in many cases. The impression has certainly been made on my mind that it is possible, but only as the result of prolonged treatment, to entirely cure moderately advanced cases. The difficulty is to induce patients to stay long enough to complete the cure, and also to fulfil all the conditions required.

The patients are provided with an open-air shelter, open at one side. For amusement they have billiards and books. There is also a small garden, which they are cultivating with success.

The women have also an open-air shelter ; a hen house ; and it is intended to create a small garden for them, though the soil is not very favourable.

It is desirable that a hospital should be provided specially for a much larger number of patients, with a resident staff. It should be situated beyond the reach of town fogs.

The fatal time for us is when the winter fogs settle on the City. The greatest care has then to be exercised to avert serious illness.



## SUMMARY OF THE CASES TREATED IN THE CLAYTON COTTAGES.

No.	Sex	Age	Admitted	Discharged	Died	Condition on Admission	Condition on Discharge
1	M.	35	Jan. 11, 1905	.....	Feb. 2, 1905	Extensive disease, both upper lobes. Lungs breaking down	.....
2	M.	31	Jan. 8, 1905	June 24, 1905	.....	Both apices affected	Gained two stone. Lungs not entirely clear. Weights?
3	M.	36	Jan. 9, 1905	July 5, 1905	.....	Both lungs affected. Prolonged expiration, whispered peritonoquy rhonchi. No dulness	Gained 2st. 3lbs. Weight on discharge, lost. 11lbs. Lost 1st. 11lbs. before Nov. 23
4	M.	33	Readmitted Nov. 23	April 30, 1906	.....	.....	Practically well. A few fine rales. Gained 2st. 3½lbs Total gain, 2st. 11½lbs.
5	M.	37	Feb. 6	June 24	.....	Cavity right apex	Gained over a stone. No real improvement
6	M.	50	Feb. 7, 1905	.....	Jan. 13, 1906	Cavities both apices	Gained for a time, but then gradually lost weight. No vital power
7	M.	35	Feb. 22	Nov. 13	.....	Both upper lobes extensively affected	Gained 1st. 1lb. No improvement in condition of lungs.
8	M.	12	Feb. 22, 1905	.....	March 7	Both upper lobes affected. High fever	.....
					March 6, 1906	Both upper lobes affected. Disease active in left.	Has gained 13lbs. Lungs improved. But left lung not quite clear

SUMMARY OF THE CASES TREATED IN THE CLAYTON COTTAGES—*continued.*

No.	Sex	Age	Admitted	Discharged	Died	Condition on Admission	Condition on Discharge
9	M.	19	April 8, 1905	June 24, 1905	.....	No dulness. Increased vocal resonance, and fremitus right side	Gained 3lbs. Condition of lungs stationary
10	M.	35	June 2, 1905	Dec. 6, 1905	.....	Both upper lobes affected. Râles over left extensive	Gained 2lbs. No difference in lungs.
11	M.	22	July 1, 1905	Sept. 9, 1905	.....	Right upper lobe affected. Disease not advanced.	Gained 1 $\frac{3}{4}$ lbs.
12	M.	27	July 14, 1905	May 9, 1906	.....	Extensive disease, both upper lobes. Cavity right apex	Has gained 1 stone in weight. General health improved. Lungs not materially altered
13	M.	29	July 17, 1905	.....	.....	Cavity left apex. Right apex consolidation	Marked improvement in lungs, but his health fluctuates. Has gained 8lbs.
14	M.	19	July 22, 1905	.....	Sept. 5, 1905	Both upper lobes affected	Continued hectic fever, with steep remissions
15	M.	48	Aug. 14, 1905	March 6, 1906	.....	Disease chiefly in left apex. Dulness; no râles	Disease over same area Crepitations abundant. Has gained 1st. 12lbs. in weight. Health apparently good
16	M.	34	Sept. 16, 1905	April 6, 1906	.....	Both upper lobes affected	Lost 4lbs. Practically stationary
17	M.	24	Oct. 20, 1905	Dec. 8, 1905	.....	Both upper lobes and left lower lobe invaded	No material change in the lungs. Has gained 11lbs. in weight. Temperature shows remittent fever

## SUMMARY OF THE CASES TREATED IN THE CLAYTON COTTAGES—continued.

No.	Sex	Age	Admitted	Discharged	Died	Condition on Admission	Condition on Discharge
18	M.	34	Case 4, readmitted October 20	April 25, 1906	.....	Both upper lobes affected. Disease not extensive	Slight gain in weight. Continues fairly well.
19	M.	26	Oct. 25, 1905	.....	Oct. 28	Extensive disease both lungs	.....
20	M.	25	Nov. 7, 1905	March 20, 1906	.....	Extensive disease both lungs	Lungs unaltered. Weight:— Gained 6lbs., then fell back. Gain on discharge, 1½lbs.
21	M.	41	Nov. 16, 1905	Dec. 4, 1905	.....	Both sides invaded. Cavity right apex	Gained 1lb.
22	M.	28	Dec. 18, 1905	.....	Jan. 24, 1906	Cavities both apices	.....
23	M.	34	March 17, 1905	Still in	.....	Both lungs affected. Cavity right side. Varicocele. Very bad teeth	Is losing weight. Has lost altogether 5½lbs.
24	M.	45	March 25, 1905	Still in	.....	Both lungs extensively diseased	Stationary. Has gained 1st. 2½lbs.
25	M.	23	May 20, 1905	Still in	.....	Both lungs invaded	Has gained 2st. 4½lbs. Right lung cleared; left improved.



# CASES ADMITTED INTO CLAYTON HOSPITAL.

No.	Sex	Age	Admitted	Discharged	Died	Condition on Admission	Condition on Discharge
1	F.	19	Aug. 16, 1905	March 6, 1906	.....	Both upper lobes involved. Disease apparently extensive and progressing	Lungs nearly free from crepitation, otherwise sound. Weight on admission, 6st. 9 $\frac{1}{4}$ lbs; on discharge, 9st.
2	F.	20	Aug. 12, 1905	Dec 5, 1905	Dec 22, 1905, at home	Both upper lobes extensively involved. Right is breaking down	Extension of disease in lungs. Sent home at her urgent wish
3	F.	36	Aug. 19	Jan. 11, 1906	.....	Both upper lobes dull	Lungs much improved. Has gained 1st. 8lbs.
4	F.	28	Aug. 19	Marth 6, 1906	... ..	Both lungs extensively affected	Temperature markedly remittent. Gained 8 $\frac{1}{2}$ lbs. Discharged for home reasons
5	F.	37	Aug. 19	Jan. 30, 1906	.....	Both upper lobes involved, the right appears to breaking down	Gained 1st. 3 $\frac{3}{4}$ lbs. Lungs improved, but areas involved are unaltered
6	F.	19	Aug 21	Dec. 10, 1905	.....	Both apices dull, front and back. Crepitation both sides	Areas of dulness diminished. Less crepitation. Gain in weight of 11 $\frac{1}{2}$ lbs. Health much improved
7	F.	23	Aug. 21	April 30, 1906	.....	Very extensive disease in both lungs	Course of temperature throughout remittent. yet both lungs and health improved. Gain in weight, 1st. 8 $\frac{1}{2}$ lbs.
8	F.	19	Aug. 26	Still in	.....	Both apices and the whole of the left lung involved	This patient became quite plump and cheerful. Weight on admission 5st. 13 $\frac{3}{4}$ lbs., weight on May 4th, 6st. 11lb.

CASES ADMITTED INTO CLAYTON HOSPITAL—*continued.*

No.	Sex	Age	Admitted	Discharged	Died	Condition on Admission	Condition on Discharge
9	F.	28	Sept. 1, 1905	Jan. 13, 1906	.....	Very slight affection of R. apex	Gained 1st. 3½lbs., and was quite well on discharge
10	F.	35	Sept. 13	.....	Oct. 7	Both lungs apparently breaking down. Heart feeble	.....
11	F.	25	Oct. 16	Dec. 21	.....	Upper right lobe much involved, left slightly	Gained 8½lbs.
12	F.	40	Sept. 18	Still in	.....	Both lungs involved, not extensively	Temperature throughout remittent. Patient sinking
13	F.	19	Oct. 5, 1905	Still in	.....	Extensive disease, both lungs	Has much improved in health. Temperature throughout remittent
14	F.	38	Oct. 11	April 30, 1906	.....	Both upper lobes involved. Râles right apex	Lungs much improved. Right apex not clear. Gained 1st. 7lbs.
15	M.	6	Oct. 11	Still in	.....	Right apex affected	Has gained 9¼lbs. On admission 2st 10¼lbs.; now 3st. 5½lbs.
16	F.	10	Oct. 11	Still in	.....	Both upper lobes involved	Has gained 1 stone in weight
17	F.	18	Oct. 24	Still in	.....	Both upper lobes involved	Has gained 1 stone
18	F.	37	Oct. 24	Still in	.....	Both upper lobes affected	Has gained 1 stone
19	F.	41	Nov. 7	.....	.....	Both upper lobes involved	Has gained 2st. 2lbs.
20	F.	20	Nov. 25	Dec. 1	.....	Left apex involved	Was in only a few days
21	F.	28	Dec. 18	.....	April 4, 1906	Right lung extensively, left less involved	.....

### DELAMERE SANATORIUM.

The number of cases sent into this splendid Sanatorium by the Corporation during 1905 was 16 men and 14 women.

The conditions under which they are admitted render it desirable that cases capable of cure should remain there until they can be pronounced free from the disease.

The duration of stay has been 109 days.

The cases are examined at the Public Health Office, and a chart of the conditions found is kept. No cases are rejected by us on the score of their illness being too advanced, unless it is manifestly useless to send them to Hardman Street.

Some patients are, in fact, sent on whom I hardly expect to be admitted. The physicians at Hardman Street are expected to say whether the stage of the disease is such that the hospital can receive the patients. If admitted, the Medical Director of the Sanatorium (Dr. Lloyd Smith), sends me a chart of the condition of the chest on admission. He also gives a brief account of the condition of the case on discharge, and sends a chart of the state of the chest.

I am profoundly impressed with the number of patients who are discharged improved, but whose lungs are still affected—necessarily discharged, I admit. The condition of these poor people, and even more the position of their families, requires the most anxious consideration—not merely on their account, but for the sake of the community generally.

From this side, also, the need of a hospital for more advanced cases is an urgent one. Our beds in Delamere Sanatorium should be for the benefit of curable cases, and, as far as possible, all cases remaining there should be kept till they are quite cured.

### PART 4.

The following tables give details in reference to the work done in connection with the notification of Phthisis in 1905.

Table I. shows the number of cases notified from the Union Hospitals, from other institutions, and by private practitioners respectively.

It will be noted that the number of cases notified from the Union Hospitals has been smaller in 1904 and 1905 than in former years.



The increase of cases in 1905 from other institutions is due chiefly to the more complete notification from the Consumption Hospital. The number of cases notified by private practitioners in 1905 has also increased.

It is not certain that the increased number of notifications in 1905 does not, in reality, denote an increase in the number of cases.

The death-rates and notification figures both seem to show a fluctuation in the number of cases from year to year depending on factors which we have not, as yet, disentangled. It is, however, too early to be positive as to the significance of the figures.

TABLE I.  
NUMBER OF CASES NOTIFIED.

Year	Poor-law Cases	Institutions	Private Practitioners	Total
1900 .....	578	455	540	1573
1901 .....	625	373	341	1339
1902 .....	667	305	303	1275
1903 .....	556	550	251	1357
1904 .....	512	440	250	1202
1905 .....	527	588	291	1406
Total .....	3465	2711	1976	8152

The next table shows the institutions from which notifications are derived. Notifications from the Royal Infirmary and from Ancoats Hospital relate to out-patients and home-patients. For administrative purposes they are to be classed with cases notified by private practitioners.

Cases notified from Union Hospitals are of less value, and are more difficult to deal with

Table 3 gives a number of administrative details in reference to the cases notified in 1905.

It will be seen that more disinfection was carried out in that year than in previous years. There was also more examination of sputa. A large proportion of the specimens was sent by request. These examinations are necessary for administrative control.

It will be seen that out of the 1,382 cases visited and registered in 1905, 566 died in the same year. From a calculation made by Mr. Lock, it appears that 6½ months is the average period between notification and death.

It is a great pity that cases are not notified earlier, but, no doubt, many cases work on as long as they can stand. They ought not to be permitted to do so, or, rather, the inducements not to pursue so fatal a course should be so strong as to make the sufferers anxious and able to get effectual assistance at an early period.

TABLE 2.

## PARTICULARS OF CASES NOTIFIED FROM INSTITUTIONS.

Institutions	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Manchester Union Workhouse .....	48	88	87	126	349
Chorlton Union Workhouse .....	48	33	49	30	160
Prestwich Union Workhouse.....	9	2	1	2	14
Poor-law Union Cases .....	3	...	1	...	4
Consumption Hospital .....	68	81	113	101	363
Ancoats Hospital .....	14	10	19	19	62
Chorlton-upon-Medlock Dispensary ...	3	1	7	6	17
Hulme Dispensary .....	8	5	3	4	20
Gartside Street Dispensary .....	2	...	6	4	12
Royal Infirmary .....	5	16	18	36	75
Medical Mission, Red Bank .....	4	1	...	...	5
Northern Hospital .....	...	...	...	...	...
St. Mary's Hospital .....	4	8	10	5	27
Southern Hospital .....	...	...	...	...	...
Children's Hospital, Pendlebury .....	...	...	...	...	...
H.M. Prison .....	...	...	...	...	...
Jewish Hospital .....	...	5	2	...	7
Total .....	216	250	316	333	1115
Private Practitioners .....	79	69	70	73	291

TABLE 3.  
STATISTICS RELATING TO PHTHISIS.

	1905	1904	1903	1902	1901	1900	1899 Sept. 1 to Dec. 31	Totals
<i>Cases Visited and Registered—</i>								
Males .....	817	745	848	917	959	786	231	5303
Females .....	565	471	515	532	546	538	194	3361
Totals ...	1382	1216	1363	1449	1505	1324	425	8664
<i>Houses Disinfected—</i>								
1. By Corporation—								
(a) With solution of chlorinated lime only .....	475	449	484	601	792	581	No Record	3382
(b) With lime solution only .....	0	0	0	2	15	109		126
(c) By Esmarch's method and solution of chlorinated lime ..	1086	788	643	359	144	0		3020
Totals ...	1561 (in 1387 houses)	1237 (in 1084 houses)	1127	962	951	690	...	6528
2. By Tenants—								
Esmarch's method	2016 (in 1267 houses)	2266 (in 1404 houses)	2118	1937	1776	1299	No Record	11412
Totals...	3577	3503	3245	2899	2727	1989	...	17940
<i>Specimens of Sputum Examined:</i>								
Positive .....	298	242	239	248	232	104	...	1363
Negative .....	475	418	389	337	285	154	...	2058
Totals ...	773	660	628	585	517	258	...	3421
<i>Deaths—</i>								
(a) Among total cases visited and registered .....	566	661	578	652	638	560	93	3748
(b) Among all cases for Manchester (including those under a) .....	988	1106	1023	1145	1142	1133	270	6807
Cases reported as sent to Hospital .....	1349	1207	1159	1166	1012	851	140	6884
Notified from common lodging-houses..	155	188	206	239	254	146	41	1229



In connection with the disinfection of houses, 2,252 special cases were entered in the business book. This work includes letters to owners, tenants, health visitors, etc., the making out of forms 1, 2, and 3, receiving reports, giving instructions, checking costs, endorsing forms.

Table 4 gives particulars regarding the number of cases notified and the number of deaths occurring in each Sanitary District in 1905.

TABLE 4.  
THE NUMBER OF NOTIFICATIONS AND DEATHS IN EACH  
SANITARY DISTRICT—1905.

	CASES NOTIFIED					DEATHS 1905	DEATH-RATE Per 1000 living
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	TOTAL		
City of Manchester .....	295	319	386	406	1406	988	1.56
I. Manchester Township .....	118	148	163	216	645	388	3.00
II. North Manchester .....	44	60	66	68	238	174	0.96
III. South Manchester .....	133	111	157	122	523	426	1.33
I. { Ancoats .....	40	50	59	62	211	122	2.78
Central .....	25	29	32	62	148	97	3.58
St. George's .....	53	69	72	92	286	169	2.89
II. { Cheetham .....	17	22	21	16	76	35	0.87
Crumpsall .....	1	...	2	2	5	4	0.43
Blackley .....	2	1	4	7	14	15	1.59
Harpurhey .....	5	8	2	13	28	13	0.65
Moston .....	...	4	1	5	10	18	1.08
Newton .....	4	11	17	11	43	30	0.79
Bradford .....	8	6	15	5	34	32	1.29
Beswick .....	4	5	...	5	14	16	1.31
Clayton .....	3	3	4	4	14	11	0.95
III { Ardwick .....	17	15	19	17	68	43	0.98
Openshaw .....	12	8	12	10	42	30	1.06
West Gorton .....	19	12	21	13	65	43	1.38
Rusholme and Kirkmanshulme .....	8	5	6	7	26	26	1.00
Chorlton-upon-Medlock .....	27	28	37	41	133	108	1.90
Hulme .....	42	35	53	28	158	134	2.07
Moss Side .....	8	8	9	4	29	21	0.75
Withington .....	...	...	...	2	2	21	0.50

It will be observed that the proportion of cases notified to deaths is highest in the central and poorer parts of the City.

In nearly every district, however, the number notified exceeds the number of deaths. It is not easy to give a satisfactory explanation of this circumstance.

If Phthisis is stationary, the number of notifications should, at this stage, be equal to the number of deaths, if all existing cases are notified, and if there are no recoveries ; also if there is no migration.

If Phthisis is diminishing, the number of deaths should exceed the number of cases notified.

The contrary, however, as we see from the table, is the fact. Certain possible explanations occur. The deaths from Phthisis may not be all registered under that cause. Doubtless this is the case, but not, apparently, to a greater extent than formerly.

As the general statistics show, the diminution in mortality in 1905 under the heading Bronchitis is considerable, and it is to this heading that deaths would, almost certainly, be transferred. Recoveries would account for a certain number, and an effort will be made to ascertain the number of genuine recoveries in cases which have come under our notice.

The largest factor, probably, lies in the number of wandering consumptives reported from the Union Hospital. The death-rate is, also, raised by outside persons coming into Manchester to die. But it is not raised to the same extent that the notifications are.

Then, also, it is probable that some of the cases notified are not consumptives.

Even with all this explanation, the excess of notifications in 1905 over deaths is striking, the more so that we know that there is a large number of unnotified cases in the City.

It will be seen from this table how heavy is the death-rate from Phthisis in the centre of the City as compared with that in South Manchester

North Manchester has a death-rate in 1905 less than one-third of that in the Central division.

The following figures show the manner in which the mortality from Phthisis has been distributed in the different divisions of the City for a number of years ; also in the district of Ancoats :—

	1891	1892	1893	1894	1895	1896	1897	1898
Manchester Township..	3·04	3·05	2·97	2·97	3·29	3·12	3·35	3·02
North Manchester .....	1·52	1·19	1·20	1·27	1·30	1·19	1·38	1·33
South Manchester .....	2·02	1·90	1·94	1·73	1·97	1·78	1·83	1·69
(excluding Moss Side and Withington)								
Ancoats .....	2·67	2·70	2·47	2·79	2·69	2·55	2·50	2·64
	1899	1900	1901	1902	1903	1904	1905	
Manchester Township..	3·09	3·52	3·49	3·54	3·00	3·14	3·00	
North Manchester .....	1·34	1·32	1·21	1·29	1·05	1·23	0·96	
South Manchester .....	1·86	1·80	1·93	1·83	1·79	1·90	1·53	
(excluding Moss Side and Withington)								
Ancoats .....	2·81	2·87	2·82	3·17	2·43	2·26	2·78	

Table 5 exhibits the occupations of persons notified as suffering from Consumption during 1905 at the supposed time of infection :—

TABLE 5.  
PHTHISIS, 1905.  
PRINCIPAL OCCUPATIONS—MALES.

Occupation	General	Crumpsall	Withington	Total
Barmen .....	11	1	5	17
Bakers .....	...	...	...	...
Brass and Copper Workers .....	4	2	...	6
Building Trade .....	12	9	3	24
Carters .....	10	7	3	20
Commercial Travellers .....	5	...	1	6
Cotton Manufacture .....	7	1	1	9
Clerks.....	26	1	4	31
Coach Drivers and Cleaners.....	2	...	4	6
Dock Labourers .....	1	6	...	7
Dyers .....	2	6	2	10
French Polishers .....	1	1	...	2
Gaswork Employees .....	2	2	...	4
Glass Workers .....	6	1	...	7
General Labourers .....	28	48	28	104
Hawkers .....	3	25	5	33
Horsekeepers.....	3	1	2	6
Housepainters .....	6	1	1	8
Hairdressers .....	2	...	...	2
Ironworkers .....	48	25	9	82
Leather Trade .....	...	1	...	1
Labourers at Chemical Works.....	...	...	1	1
Market Porters .....	6	19	1	26
Pattern Card Makers.....	3	...	1	4
Printers .....	9	2	1	12
Plumbers .....	3	...	2	5
Pork Butchers .....	...	...	...	...
Rubber Workers .....	11	...	4	15
Railway Employees .....	7	1	1	9
Scholars and Scholastic.....	31	3	4	38
Soldiers .....	8	6	3	17
Shoemakers .....	7	12	4	23
Tailors .....	8	4	1	13
Warehousemen (excluding Porters)...	23	6	6	35
Warehouse Porters .....	8	7	5	20
Woodworkers.....	14	10	9	33
Whitesmiths. ....	4	1	2	7
Total .....	321	209	113	643



## PHTHISIS, 1905.

## PRINCIPAL OCCUPATIONS—FEMALES.

Occupation	General	Crumpsall	Withington	Total
Cotton Manufacture .....	27	7	3	37
Charwomen .....	23	17	12	52
Do.    at Public-houses .....	6	1	1	8
Domestic Servants .....	13	8	5	26
Fancy Box Makers .....	4	...	1	5
Housework .....	135	14	18	167
Hawkers .....	9	6	2	17
Laundresses .....	7	...	1	8
Machinists .....	35	3	2	40
Milliners and Dressmakers .....	5	...	...	5
Printing Trade .....	5	1	1	7
Rubber Workers .....	7	1	1	9
Rag Sorters, &c. ....	1	5	...	6
Scholars .....	35	2	4	41
Smallware Manufacture .....	...	...	...	...
Tobacco Workers .....	1	...	...	1
Tailoresses and Mantle Makers .....	11	...	2	13
Employees at Public-houses (excluding Charwomen)	5	...	4	9
Shopkeepers and Assistant's .....	12	...	...	12
Metal Works (Employees at) .....	5	1	1	7
Furriers .....	2	...	...	2
Clerks .....	3	...	...	3
Brushmakers .....	2	1	...	3
Total .....	353	67	58	478

The greatly increased number of occupations recorded over the number in previous years is due to a slight extent to the inclusion of fresh occupations, but chiefly to the pleasing fact that the increased number of notifications in 1905 was not in Union Hospitals, but in cases from other institutions and from private practitioners. The increase has no reference to increased incidence of Phthisis.

It is, therefore, useless to compare the numbers under any occupation with those recorded in previous years with a view to see whether any particular occupation has increased or diminished in fatality. For this to be a valid proceeding, it would be necessary that approximately all cases should be notified.

We observe in these lists that in a number of the occupations the numbers reported from home are smaller than the numbers reported from the Union Hospitals. These are in 1905, amongst males :—Coach drivers and cleaners, 2 to 4 ; dock labourers, 1 to 6 ; dyers, 2 to 8 ; general labourers, 28 to 76 ; hawkers, 3 to 30 ; market porters, 6 to 20 ; soldiers, 8 to 9 ; shoemakers, 7 to 16 ; warehouse porters, 8 to 12 ; wood workers, 14 to 19. Amongst females :—Charwomen, 23 to 29 ; ragsorters, 1 to 5.

In the following classes the numbers were equal, or nearly so :—

Employed in the building trade, carters, french-polishers, gaswork employees, horsekeepers, whitesmiths, domestic servants, female hawkers, employees at public-houses.

The employments named in the first list may be regarded as standing in special association with poverty, and with the habits which lead to poverty.

If, now, we compare the table given above with that for 1904, we find that, while all the classes named for 1905 as having more persons reported from Union Hospitals than from homes of their own are alike in this respect in the list for 1904, with the exception of dyers and wood workers, the preponderance of cases from the Union Hospitals is greater in 1904.

Thus all the warehouse porters, 18 in number, are from the Union Hospitals, 11 out of 17 soldiers, and all the market porters—24 in number. The following classes in 1904, in addition, are in that list :—Bakers, persons in the building trade, glass workers, house painters, hairdressers, labourers at chemical works, female hawkers, laundresses.

It is notable that no bakers were notified in 1905.

Further, amongst those classes in which the majority were notified from home, the preponderance is greater in 1905 than in 1904. This is most conspicuous in the case of the females.

In this connection I would refer to the valuable table prepared by Mr. Lock, and published in the Annual Report for 1902, showing the average period at which a person has continued at work of various descriptions after the first appearance of illness. In some of these occupations the influence of the

occupation in shortening the period of work appears very clearly, as in the case of brass works, bookbinders, brushmakers, capmakers, calico printers, rubber-ball makers, sewing machinists, tobacco workers, waste workers. In other instances other factors enter. But, whatever the influence of occupation may be in the production of the disease, its influence in shortening the available period of work after the commencement of the disease is very clearly brought out.

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The great reduction in mortality from Phthisis which has been going on all over the country for a long series of years is a fact of cardinal importance, since on its correct interpretation depend the lines of action which we must pursue in future.

It occurs most conspicuously among adolescents and young adults, and a similar reduction at these periods of life has taken place from all diseases.

This must be ascribed in no small degree to factory legislation.

The fact is, however, quite the same in kind in parts of the country to which factory legislation has not penetrated.

This, again, may be due, in part, to the extension of school life.

In addition, however, while wages have increased, the price of food and clothing has diminished, and it is probable that the better housing, clothing, and feeding which have thus been generally attained have been the chief factor in the improvement manifested.

The large and increasing isolation of cases of Consumption in Hospital has, no doubt, contributed to the same result, and the Consumption Hospital may be made to aid greatly in the prevention of the disease, as it has long done in Manchester.

Indeed, I am strongly of opinion that a special Hospital for Consumptives not in the early stage of the disease should be provided by the City.

At the same time, the social factors which give potency to infection, and which no amount of prosperity will eradicate, require special consideration and management.

That these social factors are largely, if not mainly, responsible for the continuance of the disease is shown by the death-rates from Phthisis in Central, South, and North Manchester respectively, which stand in the same order of poverty. There is no circumstance known to me which invalidates materially the force of this argument.



It is thus necessary, in the prevention of the disease, to consider and deal with three separate but important points :—

1. The circumstances of families in which Phthisis has occurred. (Poverty and other social factors.)
2. Special preventive action. (Work done under notification.)
3. The provision of sufficient and suitable isolation in hospital.

Table 6 is a summary of the sources to which cases are traced by the enquirer, given separately for cases notified at their own homes, and for cases notified from the Union Hospitals. The heading “less likely” might more properly be “fairly likely.” The total cases in A and B are made up of the traced cases likely, less likely, possible, cases infected outside Manchester, and cases in which no information as to any source of infection has been obtained. The large numbers under this last heading indicate that the same skill is not available as when the cases were submitted to a strenuous enquiry by the Assistant Medical Officers. Nevertheless, a high proportion is still traced, and, *per contra*, it has been possible to carry out more cleansing, and to keep the cases more immediately followed up than was always possible before.

It would, however, be with regret that I should see any serious lapse in the tracing of cases, as most valuable suggestions for administrative action are obtained from these enquiries.

In the column “likely” I have inserted, in addition to the figures for 1905, figures for 4 years, so as to make the relationships clearer.

Males, it will be seen, preponderate as ascertained sources of infection. This is in accordance with the fact that Phthisis attacks considerably more males than females. That it does so is, perhaps, owing partly to the more severe exposure of males to injurious occupational influences. Chiefly, however, it is owing, in all probability, to two factors: the greater extent to which males frequent public-houses and accumulate in common lodging-houses, and the prevalence amongst them of the spitting habit.

Infected, then, in the workshop and public-house, they bring the infection home to their families.

It will be seen, in fact, that workmates and companions play a very prominent part in the proved exposure to infection in a degree and at a time likely to have caused the illness under investigation.

The numbers of infecting relatives are very differently distributed in the Union cases from what they are in the home cases. It is doubtful if this implies more than that the persons sent to the Union Hospitals are older than the corresponding class notified from their own homes. Their relationships are, thus, entirely altered.

The sources of infection, so far as it has been possible to ascertain them, are given in the following tables :—

TABLE 6A.  
CASES OTHER THAN THOSE NOTIFIED FROM THE WORKHOUSES

MOST PROBABLE SOURCE OF INFECTION	Likely 1905	Likely 1902-1905	Less Likely	Possible	Total
Father .....	18	110	18	1	37
Mother.....	10	66	21	3	34
Brother .....	33	111	16	3	52
Sister .....	22	85	15	2	39
Husband .....	9	35	7	1	17
Wife .....	3	24	6	..	9
Uncle .....	3	16	6	..	9
Aunt .....	2	15	2	..	4
Son.....	4	17	3	..	7
Daughter.....	2	14	4	..	6
Grandfather .....	1	3	..	1	2
Grandmother .....	2	4	..	1	3
Nephew .....	..	..	..	..	..
Niece .....	2	..	..	..	2
Mother-in-law.....	1	4	..	1	2
Brother-in-law .....	4	21	4	1	9
Sister-in-law .....	3	12	2	1	6
Cousin .....	4	7	1	..	5
Relatives .....	3	6	2	..	5
Companion .....	34	77†	19	1	54
Schoolfellow .....	2	..	8	1	11
Neighbour .....	7	25†	15	3	25
Tenant (Landlady, &c.) .....	1	14	1	..	2
Lodger .....	9	26	8	1	18
Patients or Hospital, &c.....	..	..	5	..	5
Employer .....	2	4†	..	..	2
Workfellow .....	39	104†	46	4	89
Workplace or Work .....	3	22†	44	5	52
Houses (including public-houses, &c.) .....	17	56†	58	3	78
Milk or Food .....	..	..	3	2	5
Club .....	..	..	..	1	1
Clothing .....	..	..	..	2	2
Re-infected .....	..	6†	6	..	6
Army .....	2	..	1	1	4
Infected outside Manchester ...	..	..	..	..	13
No information .....	..	..	..	..	131
Cases with Multiple Sources included in the above.....	..	..	..	..	149
Total.....	242	..	321	39	746*

\* The 149 cases with multiple sources are not included in this total.      † Three years

TABLE 6B.

## CASES NOTIFIED FROM THE WORKHOUSES.

SOURCE OF INFECTION	Likely 1905	Likely 1902 - 1905	Less Likely	Possible	Total
Father .....	6	28	3	..	9
Mother.....	5	26	11	2	18
Brother .....	5	42	6	..	11
Sister .....	6	32	4	1	11
Husband .....	7	31	3	..	10
Wife .....	7	32	6	1	14
Uncle .....	2	5	3	..	5
Nephew .....	1	..	..	..	1
Son.....	3	11	..	..	3
Daughter.....	..	9	3	..	3
Step-brother .....	1	..	..	..	1
Nephew and Niece .....	..	17	1	..	1
Father-in-law .....	1	3	..	..	1
Sister-in-law .....	2	3	1	..	3
Son-in-law.....	..	2	..	..	..
Brother-in-law .....	1	4	3	..	4
Cousin .....	2	..	..	..	2
Companion .....	16	41†	15	..	31
Schoolfellow .....	1	..	3	..	4
Neighbour .....	3	11†	5	2	10
Tenant (Landlady, &c.) .....	1	10	3	..	4
Lodger and Fellow-lodger .....	7	20	3	1	11
Employer .....	..	..	..	..	..
Workfellow .....	5	34	21	4	30
Workplace or Work .....	4	27	36	4	44
Houses (including P.H.'s, C.L.H.'s) .....	21	153	157	2	180
Army .....	5	19	..	..	5
Milk .....	..	..	1	..	1
Asylum or Workhouse .....	2	..	6	..	8
Outside Manchester .....	..	..	..	..	6
No information .....	..	..	..	..	176
Multiple Sources included in the above.....	..	..	..	..	152
Total.....	114	..	294	17	607*

\* The 152 cases with multiple sources are not included in this total.

† Three years.



I have not thought it necessary to illustrate fully for this year the history of infection from various sources. I will merely give one or two striking histories which have been handed to me by Mr. Lock, and which will serve as examples of many others :

Case 708/00. (R. N.)—æt. 25. Labourer. Died July, 1900.

(S. P. N.)—æt. 21. Railway labourer. Registered cause of death, Phthisis. February, 1902.

(F. E. N.)—æt. 26. Railway labourer. Registered cause of death, Phthisis. May, 1904.

Case 1038/05 (M. N.)—æt. 24. Ill 2 years. Notified September, 1905.

F. E. N. was this patient's husband ; and the first two were brothers-in-law.

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Case 738/00. (A. B.)—æt. 24. A sailor, home for 5 or 6 weeks between voyages. Ill 2 years. His mother, who committed suicide, had had cough, and spit for 2 years up to her death.

Case 781/00. (E.), sister of A. B.—æt. 21. Ill 5 months. Tubercle bacilli found in sputum. Brother lived with her between his voyages, and probably infected her. Both have since died.

Case 1039/05. A married sister of the foregoing cases. Ill 3 years. Was evidently infected by E, whom she nursed up to her death in 1901.

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Case 1054/05. (E. D.)—æt. 34. Ill over 6 months, probably several years.

Case 453/03. Cousin of the above (æt. 5), lived next door up to October, 1903, and had been ill there 1 year. He may have infected E. D.

Case 352/99. (S. D.). Step-sister of E. D. Ill from December, 1897, lived with her for about a year in 1900-1, and may have infected her.

The father and mother of S. D. had died of Phthisis about the time she began to be ill.

Case 877/02 was the father of the child (453/03) mentioned above, and died of Phthisis about 5 months before the son's disease showed itself.

This man is believed to have been infected by a workfellow.

E. D.'s father was certified as dying of Phthisis in February, 1898, and her mother is reported to have died about 11 years previously from the same disease.

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A man named H. R. K. is reported to have died of Phthisis in 1892.

He is believed to have been the source of infection in case 466/02, his son (S. K.).

During the course of his illness S. K. was in the habit of sitting a great deal in the shop of a shoemaker (P. N.), case 523/04, who contracted Phthisis at that period.

Both these cases have died of that disease.

The shoemaker had a son (W. N.), case 1068/05, who became ill from Phthisis 6 months ago, about the time his father died. Tubercle bacilli have been found in the son's sputum. He slept with his father up to the time the latter went to Hospital. The father was very careless as to the disposal of his sputum.

Case 318/00, a gas stoker, was believed to have been infected at the gas works, at which there were several consumptives.

This man was frequently visited during his illness by his sister (K.), case 332/03, who was thus exposed to infection.

K. was also associated with two consumptive workfellows (cases 267/00 and 750/02), and died of Phthisis in June, 1903.

She, in her turn, was often visited by her companion (D. B.), case 1095/05, and infected D. B., in whose sputum tubercle bacilli have been found.

Case 445/05. (R. T.). Married. Was a cleaner at C. L. H.'s, and apparently infected from that source. She began to be ill in December, 1904.

Case 669/05. (A. L.)—æt. 19. Daughter of the foregoing, began to be ill in the following April. The family of 5 persons, of 12 years and upwards, were then living in a two-roomed house. She was removed to Clayton Hospital. Appears to have been infected at the workplace.

Case /06. (J. T.)—æt. 50. Husband of case 445/05 and step-father of case 669/05. Began to be ill in April, 1906. There is, however, an indefinite history of cough and slow losing of flesh for some years, and it is suspected that he infected all the other cases.

This man's first wife, and a paramour who followed her, are said to have died of Phthisis.

Although the numerous histories of infection formerly given are not repeated for 1905, I would none the less emphasise the fact that the usual mode of infection in Phthisis is from person to person either directly or by means of dried material from tuberculous discharges.

This disease is eminently one in which the process of infection can be interrupted if the requisite measures are taken.

## MILK AND TUBERCULOSIS.

By J. W. BRITTLEBANK, M.R.C.V.S.

I have pleasure in submitting my report on the work done during the year 1905.

My duties are—(1) Inspection of the Manchester Cowsheds and Dairies as to compliance with the Manchester Regulations made under the Dairies, Cowsheds, and Milkshops Order; (2) to carry out the duties of Veterinary Inspector in the working of the Milk Clauses contained in the Manchester General Powers Act, 1899.

### *Manchester Cowsheds.*

These number 202 on 109 farmsteads, and house about 1,788 cows. These numbers include the cowsheds in the districts of Moss Side and Withington; and throughout the report, when mention is made of the City the whole area is included.

In the course of the regular inspection of farms within the City, 584 visits have been paid and 1,096 inspections of cowsheds made. The total number of inspections of cows is 10,527.

These totals indicate that a number of visits have been paid to most farms. As mentioned in previous reports, however, it is not possible nor advisable to attempt regularity in inspection: it is obvious that some dairymen require greater supervision than others.

I am pleased to say that, on the whole, I consider the past year to have been a fairly satisfactory one. I have had very little cause for complaint in the cleanliness of the cowsheds. Small inattentions are, of course, constantly occurring, such as to find one cow somewhat dirty, but this is usually an accident—due, perhaps, to the cow lying in her own dung, and is readily remedied. I can, however, safely say that the cleanliness of the cows' udders has been very satisfactory. It would certainly be desirable if a regular and systematic cleansing of each cow's udder could be obtained previous to each milking, and, with this object in view, some of the dairymen rub the udder with a dry towel before proceeding to milk.



This rubbing with a dry towel is as far as they will go, and I certainly have not pressed for the udders to be washed, as, under existing circumstances, it is hardly feasible.

It was stated in last year's report that some farmers had agreed to provide milking smocks for the milkers. In many cases these smocks were undoubtedly obtained, but the difficulty is to make the men wear them. As an instance, at one farm smocks were provided, and the farmer and his sons regularly wear them, but it is not so with the men, who I know have to be watched closely. To obtain men to milk is a considerable difficulty, and at many farms great inconvenience is experienced in getting a supply of efficient hands; it is, of course, possible to employ a considerable number of men of the tramping class, who really only require employment for a few days. The employment of this class is discouraged as far as is possible; they are dirty in their habits, and but poor milkers. I am glad to be able to state that the number of men of this class employed on the City farms is diminishing.

The work of reconstructing the insanitary cowsheds has been carried on, but only little progress was made during the year. The insanitary cowsheds at four farms have been reconstructed; in fact at one farm the building, being unsafe, was pulled down and entirely rebuilt. At two farms the keeping of cows has been discontinued, but the numbers remain the same, as two other cow-keepers have been registered, one of these leaving his old farm to go to one of the reconstructed ones. At four farms where plans and specifications had been sent out the work has had to be delayed, but will doubtless be carried out during the summer of 1906.

I do not propose to discuss at any length the details of the alterations in reconstruction of the insanitary cowsheds, as a good many points have been enlarged upon at some length in previous reports.

In the Annual Report for 1903, I drew attention to the method of arranging the stalls so that the animals should be kept as clean as possible. Briefly, the arrangement is to have—(1) a stall which is not too long; (2) one that has rails across the front of sufficient height to prevent the animal reaching over into the feeding passage; (3) a dung drop of sufficient height and a channel of adequate width to accommodate the large amount of solid excreta.

In one cowshed at least these requirements were carried out almost in their entirety; the height of the heelstone was certainly somewhat less than was recommended, but the cleanliness of the cows has been extremely satisfactory, and there has been no difficulty in keeping the cows' quarters and udders free of dung.

I regret to say that I see no progress made in the direction of the provision of appliances for the cooling of milk. The public demand for warm milk is as great as ever.

It will be seen that no special note has been made of the farms in the Withington district. A considerable number of these farms have been reconstructed prior to incorporation, and, speaking generally, the buildings are fairly satisfactory, and are kept clean.

#### *Manchester Cows.*

During the year, 10,527 examinations were made of the cows kept in the cowsheds within the City boundaries. The estimated number of cows housed within the City boundaries is 1,788.

The standard of cows kept is well maintained, and the same care is shown by farmers in their selection of cows as in former years; the cows, are of good class, well fed, and kept in good condition.

The cleanliness of the cows has been fairly satisfactory, though one would like to see a more thorough cleansing than exists in the few cowsheds where a somewhat perfunctory grooming, confined to brushing down the hind-quarters with a dandy brush, is carried out. It is, however, difficult to persuade the farmer.

One case of tuberculosis of the udder was found during the year; there was nothing special about the case, except that the circumstances of the purchase point to the difficulty farmers have when purchasing cows, in being sure that the udder is free from disease. The cow in question was an Irish animal, and was purchased at Birkenhead, the price being a fairly heavy one, and the cow, to all appearances, being a heavy milker. The udder at the time of purchase was overstocked in the usual manner, there appeared no unevenness in size in any of the quarters, and it was not until I had the cow milked that I was able to discover the slight lesions which were present. There is no doubt that the practice of overstocking a cow's udder, by not milking her for 24 to 36 hours prior to sale, may, and does lead to the purchase of many cows which, if presented for sale in a normal milking state, would not readily find a purchaser.

#### *The Manchester Milk Clauses.*

There have been no changes in the methods adopted in the working of the milk clauses of the Manchester General Powers Act, 1899.

Samples of milk are taken at the Manchester Railway Stations, or elsewhere within the City, by the Food and Drugs Inspectors. These are submitted to Professor Delépine for bacteriological examination. All samples reported by him as having been found to cause tuberculosis are followed to their source at the farm by the Medical Officer of Health (or his representative) and the Veterinary Surgeon.



The Veterinary Surgeon examines all the milking cows on the farm, and takes samples of milk from cows having diseased or suspicious udders. The special samples are taken in sterilized bottles provided by Professor Delépine, and every care is taken to avoid extraneous infection. These samples are, in turn, submitted to Professor Delépine for bacteriological examination, and in this way the fact of a cow having tuberculosis of the udder is definitely proved. Samples from cows found, by clinical examination, to have diseased or suspicious udders, without previous station samples, are examined in the same manner.

In all cases, a control sample of mixed milk is taken, so as to ensure that the examination has been satisfactory, and that the source of infection has been removed.

### *Tuberculous Milk.*

It has been stated earlier that during the year 10,527 inspections of cows were made housed in the City cowsheds, and that of this number one cow was found to have tuberculosis of the udder.

During the year 764 samples have been taken by the Food and Drugs Inspectors in connection with tuberculosis, and the number of farmers represented in this total is 565.

Of these 565 farmers, 341 reside in Cheshire, and 35 of them (10·26 per cent.) sent tuberculous milk; 100 live in Derbyshire, and 6 of them (6·00 per cent.) sent tuberculous milk; 67 live in Lancashire, and 2 of them (2·98 per cent.) sent tuberculous milk; 47 live in Staffordshire, and 3 of them (6·38 per cent.) sent tuberculous milk; 8 live in Yorkshire, and 1 of them (12·5 per cent.) sent tuberculous milk. In addition to the above, 1 farmer from Denbighshire and 1 from Shropshire sent milk, but neither of these was tuberculous.

It will thus be seen that from 565 farms a total of 764 samples have been obtained; of this total, 706 samples were taken at the Manchester Railway Stations, and the remaining 58 were obtained from farmers whose milk is brought into the City by cart. These numbers show also that in a number of cases more than one sample of a farmer's milk has been taken.

From returns supplied by the farmers themselves, the estimated number of cows at these 565 farms is 10,838, equalling an average of 19 cows per farm. During the year the udders of 3,241 cows at the country farms have been examined for tuberculosis. Of the milk tested by Professor Delépine from 565 farms, 47 were found to cause tuberculosis, giving a percentage of 8·31 farms sending tuberculous milk.

As a result of following up the tuberculous samples, 31 cows were found and pronounced to be suffering from tuberculosis of the udder; 23 of these cows were either slaughtered in my presence or I examined the carcass soon after;



in 12 cases the whole carcase was condemned ; in 8 the entire carcase was passed as fit for food ; in 1 instance half the carcase was condemned ; and in 2 instances the whole of the carcase, with the exception of a fore quarter, was passed.

In the remaining eight instances the disposal of the cows could not be definitely ascertained, although enquiries were made.

In addition to the above 31 cows which were found as the result of following up tuberculous samples, three other cows were found and proved to be suffering from tuberculosis of the udder. One of these cows was found in one of the City cowsheds, another was notified by a farmer in the country.

In the last case the farm was visited by Dr. Forbes and myself, under the Infectious Disease (Prevention) Act, 1890, in connection with an outbreak of Scarlet Fever, and it was during the examination of the cows that the last cow was found. The farm is situated outside the City.

All three of these cows referred to were slaughtered, and in two instances the carcases were found to be fit for food, and in the remaining case the carcase was condemned.

Thus, during the year 1905 a total of 34 cows in all have been proved to have had tuberculosis of the udder ; this includes the 31 cows found as the result of following up the tuberculous samples, and the three cows just mentioned, so that, at a number of the farms in which the mixed milk had been tuberculous, no cow was found. That the source of infection had been removed was proved by the use of the control sample.

For the last two years a table showing the percentage of tuberculous milk sent into Manchester has been inserted ; this year the same table, with the addition of the figures for 1905, is attached :—

TABLE I.

YEAR	Number of farmers' milk tested during the year	Total number found to cause tuberculosis in the experimental animal	Percentage of farmers sending tuberculous milk	Percentage of farmers from EACH COUNTY whose milk was found to cause tuberculosis.					
				Cheshire	Derbyshire	Staffordshire	Shropshire	Lancashire	Yorkshire
1901	272	27	9·9	10·46	9·23	8·00	10·00	...	...
1902	345	36	10·4	12·72	8·65	4·01	...	8·31	...
1903	329	45	13·6	14·76	9·58	15·15	40·00	...	...
1904	318	29	9·1	11·17	6·02	...	...	7·14	25·00
1905	565	47	8·3	10·26	6·00	6·38	...	2·98	12·50

The figures in the table presented do not call for any special comment. It will be seen that the number of samples taken has been considerably increased, so that the City milk supply has been more thoroughly supervised. The percentage of milks shown to be tuberculous for the year certainly shows a slight decrease, particularly for Cheshire, which may be taken as fairly representative.

Certainly no great amount of work has been done to improve the conditions of housing of the dairy cattle in the area from which the milk supply of Manchester is derived, but what improvement has taken place is almost entirely confined to the County of Chester, where, as before stated, certain districts do endeavour to do some work under the Dairies, Cowsheds, and Milkshops Order.

There is one direction, however, in which good may be done, even though it be found impossible to reconstruct the sheds, and that is in seeing that the buildings are kept clean.

On the whole, the cowsheds are cleaner than they used to be; still, it must be acknowledged that the average farmer's standard of cleanliness as applied to a cowshed is but a low one. The construction of many cowsheds is such as to make cleansing a matter of considerable labour, and nothing short of alteration to model conditions would simplify matters; but in this matter of cleanliness, both of the animals and of the buildings, much might be done by the farmers themselves at slight cost. It is that portion of the cowshed which is immediately behind the cows which requires attention, the part which receives the excreta, and the passage way, for it is chiefly from the cow's hind legs, tail, udder, and portions of the abdomen immediately adjacent to the udder, that most of the dirt finds its way into the milk. I have advised many farmers, as a temporary expedient, of course, failing thorough reconstruction, to go over this portion of the cowshed floor, level it as much as possible, and then run over it, particularly in the dung channel, a thin floating of Portland cement sufficient to fill up the joints, and give a practically smooth surface for cleaning by washing if necessary. In at least two instances the advice has been followed with advantage.

The cows examined by me have on the whole been satisfactory, and there is little doubt that a gradual though slow improvement is taking place. As stated previously, the improvement is noted chiefly in the fact that on the average younger animals are being kept, and I have also found that a portion of the farmers are going further a-field for their stock. In connection with this point, in the report for 1904 it is stated that Wales and Derbyshire are the districts particularly favoured by farmers in the search for healthy young animals. While it is quite correct that animals from Wales are hardy, it is in



my experience hardly correct to say so with regard to Derbyshire, which was mentioned in mistake for Cumberland.

It may be that the favourite method of rearing calves, in many parts of this county, may have some bearing on this point. The method is to tie up quite young calves in small calf stalls, arranged on a similar plan to the stalls in which adult cattle are tied, and to leave them tied up throughout the winter. I do not say, of course, that the mere fact of tying up the calves in this manner will produce tuberculosis, but these places are nothing more than hovels—dirty, dark, some of them absolutely devoid of windows. There is no ventilation, and the atmosphere in most of them that I have been into is extremely disagreeable.

No matter how satisfactory the conditions were, I should object to the tying up of young animals as a most unhealthy and unnatural procedure, and I am strongly of opinion that this method may be responsible for a considerable amount of tuberculosis.

For some considerable time now, I have made a point of advising farmers to disinfect their cowsheds two or three times a year with chlorinated lime solution, and I am pleased to report that a fair number are quite willing and do follow out the instructions given.

It is rather difficult sometimes to get the farmers to do this, because they do not understand the why or the how, but I find that the use of a large garden syringe to spray on the disinfecting solution is one of the most convenient methods to employ, and simplifies matters for the farmer.

Practically all the country farms are provided with appliances for the cooling of milk, but the position of the refrigerator is very often of a most unsatisfactory character. I have referred to the matter before, and regret that I cannot report any improvement.

The cleanliness of milkers is also a subject which has been mentioned many times, but here again I still find the same unsatisfactory state of affairs. I do not say that it is very often I see men sit down to milk without cleaning their hands—it is not likely that they will do so when I am present; but the clothes of these farm labourers are often very dirty, and smocks should be provided.

The railway milk vans have been inspected regularly throughout the year, and from time to time reports have been submitted; the vans have been kept in a satisfactory state, so far as cleanliness is concerned.



TABLE II.

Below is presented a table showing the actual results of each application of the test:—

Date of Test	Total Number Tested	MILKING HERD. Animals having been previously tested				PROBATIONARY ANIMALS. Animals not previously tested, but purchased subject to passing the test				Total Number of Animals Passing Test
		Number Tested	Number Re-acting	Number Passed	Doubtful Re-actions	Number Tested	Number Re-acting	Number Passed	Doubtful Re-actions	
October, 1902.....	101	91	11	80	0	10	4	6	0	86
April, 1903.....	108	88	3	85	0	20	6	13	1	98
October, 1903.....	108	98	1	96	1	10	4	5	1	101
April, 1904.....	103	76	0	76	0	27	10	17	0	93
October, 1904.....	103	85	0	84	*1	18	4	13	1	97
April, 1905.....	102	87	0	87	0	15	4	11	0	98
October, 1905 .....	98	84	0	84	0	14	5	9	0	93

\*Animal tested but developed Bronchitis during test.

*Tuberculin Test.*

The table showing the results of the application of the tuberculin test to the cows from which the milk is supplied to Monsall and Clayton Hospitals is again inserted, with the figures for 1905 added. The figures call for no special comment, but show that the work of keeping this large herd free from tuberculosis is being successfully carried on. (See Table II.)

In past years it has been customary to give a detailed report of the disposal of each cow found to have been suffering from tuberculosis of the udder. This year only those cases which show any special point of interest are given:—

Case 206.—In this case the cow was not found at the first visit, but the control sample having proved infective, the farm was again visited, and this time the affected animal was found. The farmer had in the meantime discontinued sending his milk to Manchester, and was sending it to another town. The disposal of the cow was not ascertained.

Case 226.—In this case the following report had been received from Prof. Delépine: “That both animals died too soon after inoculation for a reliable diagnosis to be made.”

The Veterinary Surgeon visited the farm and made an inspection of the premises, and examined the cows, and no apparent cause could be found at the farm. The cows were fairly clean, and the cowsheds satisfactory. The water supply was also found to be good.

Another station sample was obtained about three weeks after, and on this occasion Professor Delépine reported that the sample had been found to cause tuberculosis.

The farm was again visited on April 18th, and the cows examined, and one of the cows was found to have tuberculosis of the udder fairly well marked. This cow was certainly not in the herd at time of first visit, as she was in a loose box, and at the time of the Veterinary Surgeon's inspection was in the act of parturition.

The cow was slaughtered on May 22nd, and half the carcass (the fore-quarters) was found to be unfit for food.

Case 234.—This cow was not found at the first visit, but the control sample proving infective the farm was again visited, and the cow was found.

The carcass was found to be unfit for food, although fat and in excellent condition.

Case 239.—This is another instance in which the cow was not found at the first visit, but was found after the control sample had been reported upon as still being capable of producing tuberculosis.

The ultimate disposal of the cow was not properly ascertained, as immediately after the second visit this man gave up farming, and sold the whole of his cows. Another farmer who was present at the sale, and knew the diseased cow in question, informed the Veterinary Surgeon that a dealer well known for dealing in cattle of this character had purchased the animal.

Case 240.—This case again illustrates the value of the control sample.

At the first visit by the Veterinary Surgeon, one cow showing fairly well-marked disease of the udder was found, and was ultimately slaughtered, and the carcase was passed. Although this cow had been removed, the control sample was still found to be infective, and the farm was again visited, and although a very careful examination was made of the cows' udders after they had been milked, no cow showing signs of udder disease could be found; but before leaving the farm the Veterinary asked the farmer to keep a careful watch on the cows, and to immediately report to the Medical Officer of Health any cow which showed signs of change in the udder.

About a fortnight later the farmer notified that the udder of one of the cows had become swollen. The farm was immediately visited by the Veterinary Surgeon, and this cow was examined, and a sample of milk taken, which ultimately proved to be tuberculous.

The interesting point here was the fact that at both visits prior to the final one this cow appeared to be one of the least suspicious animals on the place, being 4 years old in the very prime of condition, and the farmer stated that ultimately the swelling in the udder, which affected two quarters and was very marked, appeared suddenly one morning without any preliminary warning. This sudden development has been noted and reported upon previously.

Case 245.—In this case, at the time of visit the cows on the farm were found to be in poor condition, due undoubtedly to the want of proper food. Advice was given to the farmer as to how to amend the feeding, and at a subsequent visit the cows had improved considerably in condition.

The cow found at this farm, and which was proved to have tuberculosis of the udder, was slaughtered at the farm, and the carcase found to be unfit for food.

There are five other cases in which the infective animal was not found at the first visit, but after the control sample had been found to be capable of producing tuberculosis. None of these cases contain any special features worthy of note.



Examinations of  
milk for tubercle  
bacilli

The following table of samples submitted in connection with the Manchester Milk Clauses summarises the work of the year :—

1905.

Number of specimens mixed milk taken at the station	706	
Number of specimens mixed milk elsewhere	58	
Number of each found to contain tubercular infection	Station 44	Elsewhere 3 In addition, 33 control samples were taken at the stations, of which 16 were proved capable of causing tuberculosis.
Number of farms visited in consequence	48	Additional 7 visited as result of notification or otherwise.
Number of specimens taken from individual cows as results of following up station and other samples	108	
Number of milks from individual cows proved to be tuberculous out of those given in the preceding column	30	
Number of udders proved to contain tuberculous lesions	29	
Number of milks taken from individual cows as the result of <i>notification</i> or <i>otherwise</i> than owing to the presence of tubercle bacilli in mixed milk	4	
Number of udders in last column shown to be tuberculous by bacteriological examination	3	
Total number of specimens submitted for examination	876	

# THE FACTORY AND WORKSHOP ACT, 1901.

I beg to submit a statement of work done under this Act on the Form issued by the Home Office :—

## FACTORIES, WORKSHOPS, LAUNDRIES, WORKPLACES, AND HOMEWORK.

### I.—INSPECTION.

*Including Inspections made by Sanitary Inspectors or Inspectors of Nuisances.*

Premises	Number of		
	Inspections	Written Notices	Prosecutions
Factories (including Factory Laundries) ... ..	15767	473	22
Workshops (including Workshop Laundries) ...			
Workplaces ... ..			
Homeworkers' Premises ... ..	2765	9	...
Total ... ..	18532	482	22

### 2.—DEFECTS FOUND.

Particulars	Number of Defects			No of Prosecutions
	Found	Remedied	Referred to H.M. Inspector	
<i>Nuisances under the Public Health Acts :—</i>				
Want of cleanliness ... ..	179	179	...	...
Want of ventilation ... ..	26	26	...	...
Overcrowding ... ..	10	10	...	1
Want of drainage of floors ... ..	10	10	...	...
Other nuisances ... ..	84	84	...	...
Sanitary accommodations—				
Insufficient ... ..	60	10	...	...
Unsuitable or defective... ..	58	14	...	...
Not separate for sexes ... ..	2	1	...	...
<i>Offences under the Factory and Workshop Act :—</i>				
Illegal occupation of underground bakehouse (S. 101) ... ..	2	...	...	1
Breach of special sanitary requirements for bakehouses (SS. 97 to 100) ...	...	...	...	...
Failure as regard lists of outworkers (S. 107) ... ..	...	...	...	16
Giving out work to be done in premises which are { unwholesome (S. 108)	...	...	...	...
{ infected (S. 110) ...	...	...	...	...
Allowing wearing apparel to be made in premises infected by Scarlet Fever or Smallpox (S. 109) ... ..	...	...	...	...
Other offences ... ..	988	988	...	4
Total ... ..	1417	1322	356	22

3.—OTHER MATTERS.

Class		Number
Matters notified to H.M. Inspectors of Factories :—		
Failure to affix Abstract of the Factory and Workshop Act (S. 133) ... ..		356
Action taken in matters referred by H.M. Inspectors as remediable under the Public Health Acts, but not under the Factory Act (S. 5)—		
Notified by H.M. Inspector ... ..		89
Reports (of action taken) sent to H.M. Inspectors		130
Other ... ..		41
Underground Bakehouses (S. 101) :—		
In use during 1904 ... ..		74
Certificates granted {	in 1904 ... ..	38
	in 1905 ... ..	16
In use at the end of 1905 ... ..		56
Homework :—		Number of
		Lists      Outworkers
<i>Lists of Outworkers (S. 107) :—</i>		
Lists received ... ..		943      6296
Addresses of outworkers {	forwarded to other Authorities	996
	received from other Authorities	89
<i>Homework in unwholesome or infected premises :—</i>		Wearing Apparel      Other
Notices prohibiting homework in unwholesome premises (S. 108) ... ..		...      ...
Cases of infectious disease notified in homeworkers' premises		12      ...
Orders prohibiting homework in infected premises (S. 110)		6      ...
Workshops on the Register (S. 131) at the end of 1904 :—		
Workshops ... ..		4589
Bakehouses ... ..		512
Total number of Workshops on Register ... ..		5101



The action taken up to this time in respect of underground bakehouses is set forth in the following tables :—

*Bakehouses Closed during the Year 1905.*

Situation	Situation
<i>Cellars.</i>	<i>Cellars—continued.</i>
3, Cateaton Street.	4 and 6, Buxton Street.
62, Great Ducie Street.	63, Princess Street.
35, Andrew Street.	46, Booth Street East.
18, Butler Street.	

79, Brook Street.—Here alterations are almost completed.

27, Chancery Lane is still in occupation. The occupier is building a new bakehouse on the ground level, the completion of which is expected in three months' time.

When the alterations at 79, Brook Street have been completed, and a certificate granted, there will then remain no uncertificated underground bakehouse in occupation, and the total number in use will be 56.

*Bakehouses Closed during the Year 1905—Continued.*

Situation	Situation
<i>Above Ground.</i>	<i>Above Ground—continued.</i>
37, Bury New Road.	256, Rochdale Road.
39, Julia Street.	774, Ashton Old Road.
12, Smedley Lane.	452, Ashton Old Road.
124, Bury New Road.	674, Ashton Old Road.
87, Rochdale Road, Harpurhey.	468, Ashton Old Road.
147, Halliwell Lane.	53, Brunswick Street.
1, Merryfield Street.	227, Clowes Street.
3, Williams Place, Factory Lane, Harpurhey.	45, Clowes Street.
9, King Edward's Buildings, Harpurhey.	176, Gorton Lane.
47, Butler Street.	31, North Road, Longsight.
191, Oldham Road.	399, Oxford Road.
234, Oldham Road.	6, Bentinck Street.
49, Jersey Street.	11, Albert Place.
	8, Clarendon Street.
	119, Chester Road.

*Bakehouses Closed during the Year 1905—continued.*

Situation	Situation
<i>Above Ground—continued</i>	<i>Above Ground—continued</i>
84, Edensor Street.	52, Coupland Street.
48, Jersey Street.	137, Denmark Road.
41, Turner Street.	20, East Street.
213, Queen's Road.	42, East Street.
78, Primrose Street.	13, Great Jackson Street.
81, Attleboro Road.	150, Great Jackson Street.
23, Bengal Street.	4, Hardman Street.
3, Elias Street, Queen's Road.	158, Lower Moss Lane.
61, Butler Street.	4, Leaf Street.
2, Sycamore Street.	83, Tamworth Street.
175, Butler Street.	15, Upper Jackson Street.
202, Great Ancoats Street.	21, Medlock Street.
236B Mill Street.	121, York Street, Hulme.

The following table shows the amount of work done since the commencement of operations in 1894 :—

Year	Bakehouses Altered	Bakehouses Closed
1894 .....	3	3
1895 .....	16	12
1896 .....	28	19
1897 .....	22	31
1898 .....	18	17
1899 .....	12	18
1900 .....	8	13
1901 .....	3	17
1902 .....	0	19
1903 .....	2	16
1904 .....	73	106
1905 .....	39	61
	224	332
	Total, 556.	

The alterations here mentioned have been in all cases considerable, and were, for the most part, carried out according to careful specifications drawn up in the City Surveyor's Department to comply with the requirements of the Medical Officer of Health.

Sixteen bakehouse certificates have been granted during the year 1905.

Seven underground bakehouses were closed in 1905, and 39 were altered.

Altogether, since 1894, 224 bakehouses have been altered and 332 have been closed.

The new bakehouses erected during the year 1905 are as follows :—

*Statement of the Bakehouses approved by the Improvement and Buildings Committee, and completed during the year 1905, numbering 13.*

Situation	Owner	Date of Completion
Copper Street and Tin Street, Rochdale Road	M. & F. Boddy .....	14th November, 1904
73, Great Ducie Street	A. Hyman .....	5th December, 1904
Lyndhurst Street, Ardwick	H. Morris .....	9th December, 1904
Berwick Street, Chorlton-upon-Medlock	N. Ryder .....	19th December, 1904
Inkerman Street and Topley Street, Rochdale Road	Weatherby & Sons ...	3rd January, 1905
Rear of 694, Stockport Road, Rusholme	H. & J. Stott .....	17th January, 1905
Bath Street and Halston Street, Hulme	A. E. Clarke .....	25th January, 1905
Whitby Street and Cobden Street, Bradford Road	H. Hayes .....	8th April, 1905
111, Gorton Lane, West Gorton	J. Hayes .....	3rd May, 1905
Rear of 218, Oldham Road, Newton Heath	J. Tootell .....	19th May, 1905
Rear of 324, Oldham Road	T. Bradley .....	27th May, 1905
Gordon Street, Moss Side	Smallmans Limited ...	25th August, 1905
14, Harris Street, Strangeways	W. Stone .....	6th September, 1905

## HOUSING OF THE WORKING CLASSES.

I give, herewith, figures showing the operations of the Housing Sub-Committee during 1905. This Sub-Committee is considering the general policy on which it has hitherto acted, and the extensions of that policy which should be adopted. The subject is too intricate and too large to be dealt with, in the first instance, in this report. But it will form my principal subject of consideration during the present year.

The number of houses closed during 1905 is smaller than in any of the years 1902—1904.

The number of new houses certified as fit for human habitation is smaller than in any year since 1895, if we exclude Withington and Moss Side. There is, however, an increase in those districts and also in Salford, Eccles, Levenshulme, and the aggregate number of new houses in neighbouring districts is greater than in recent years, yet not so much so as to show a great pressure of increasing population.

Recent discussions on the housing question have produced a ferment which is bound to result in a careful examination of the whole subject, so that the maximum of benefit may be obtained at the minimum of expense.



Meantime we cannot be wrong in asserting the principle that the first requisite is cleanliness both in the house and in its immediate surroundings, at all events so far as Manchester is concerned.

RETURN SHOWING THE NUMBER OF HOUSES CLOSED, DEMOLISHED, OR ADDED TO OTHER HOUSES, THEREBY BEING DISCONTINUED AS SEPARATE HABITATIONS WITHIN THE CITY, FROM FEBRUARY, 1885, TO DECEMBER 31ST, 1904, ALSO FOR 1905.

SANITARY DISTRICT	Number of Houses Closed, Demolished, or added together or to other Houses		Number of Houses Closed which have not up to the present time been allowed to be re-opened		Number of Houses Closed which have been subsequently demolished		Number of Houses Closed, and subsequently added together or to other Houses, thereby being discontinued as separate habitations	
	February, 1885, to Dec. 31st, 1904	1905	February, 1885, to Dec. 31st, 1904	1905	February, 1885, to Dec. 31st, 1904	1905	February, 1885, to Dec. 31st, 1904	1905
1	355	17	85	17	155	...	115	...
2	692	10	136	...	431	4	125	6
3	723	48	146	31	271	7	306	10
4	22	10	11	6	10	2	1	2
5	4	...	1	...	1	...	2	...
6	655	5	134	5	302	..	219	...
7	240	47	50	47	146	...	44	...
8	43	3	16	...	4	3	27	...
9	753	33	56	27	423	4	270	2
10	564	3	41	3	328	...	195	...
11	440	15	15	6	239	3	186	6
12	300	3	67	...	100	3	133	...
13	20	...	6	...	8	...	16	...
14	392	..	61	...	230	...	101	...
15	332	2	37	...	184	2	111	...
16	19	...	1	...	11	...	7	...
17	252	4	42	...	141	2	69	2
18	601	5	101	3	327	2	173	...
19	28	...	...	...	9	...	19	...
Blackley..... 20	6	...	6	...	...	...	...	...
Harpurhey... 20	15	...	...	...	13	...	2	...
21	...	...	...	...	...	...	...	...
22	174	10	12	10	77	...	85	...
23	39	...	13	...	12	...	14	...
Beswick ..... 24	...	...	...	...	...	...	...	...
Bradford ..... 24	68	...	25	...	26	...	17	...
25	...	...	...	...	...	...	...	...
26	35	...	17	...	7	...	11	...
Ardwick..... 27	...	...	...	...	...	...	...	...
West Gorton 27	16	...	2	...	8	..	6	...
28	74	...	3	...	31	...	40	...
29	...	...	...	...	...	...	...	...
Totals .. .....	6872	215	1084	155	3494	32	2294	28

In the following table is seen the rate at which Insanitary Dwellings have been closed since 1885. This was greatest in the years 1892 to 1896. If it has since slackened, this is owing not to any lack of insanitary dwellings, but to fear of producing overcrowding, and to difficulties which have arisen :—

RETURN SHOWING THE NUMBER OF HOUSES CLOSED, DEMOLISHED, OR ADDED TO OTHER HOUSES, THEREBY BEING DISCONTINUED AS SEPARATE HABITATIONS WITHIN THE CITY IN EACH YEAR FROM FEBRUARY, 1885, TO DECEMBER 31ST, 1905 (JANUARY TO DECEMBER IN EACH YEAR).

	1885 (From Febru- ary)	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	Totals
Number of Houses Closed, Demolished, or added to other Houses .....	56	103	117	191	282	165	287	564	507	782	707	507	284	297	641	266	58	346	319	393	215	7087
Number of Houses Closed which have not up to the present time been allowed to be re-opened	...	4	11	16	39	16	38	56	108	57	61	48	31	44	169	82	11	75	88	130	155	1239
Number of Houses Closed which have been subse- quently demolished.....	46	69	55	112	170	70	120	279	195	511	415	297	185	154	282	104	37	119	125	149	32	3526
Number of Houses Closed and subsequently added together or to other Houses, thereby being discontinued as separate habitations .....	10	30	51	63	73	79	129	229	204	214	231	162	68	99	190	80	10	152	106	114	28	2322

A.—STATEMENT AS TO THE NUMBER OF DWELLING-HOUSES CERTIFIED AS FIT FOR HUMAN HABITATION IN THE VARIOUS DIVISIONS OF THE CITY BETWEEN 1890 AND 1905.

DISTRICT	1st Nov., 1890, to 31st Oct., 1891	1891 to 1892	1892 to 1893	1893 to 1894	1894 to 1895	1895 to 1896	1896 to 1897	1897 to 1898	1898 to 1899	1899 to 1900	1900 to 1901	1901 to 1902	1902 to 1903	1903 to 1904	1904 to 1905	TOTALS
Ancoats .....	31	195	54	70	7	97	113	53	25	28	33	1	4	11	1	723
Central .....	{ NOTE:— 193 Artisans Dwellings	...	...	...	...	...	...	...	...	...	...	5	1	9	*95	303
St. George's .....		38	76	97	37	155	269	370	315	128	253	171	199	240	133	2589
Cheetham .....		7	18	24	44	39	37	41	18	102	53	56	82	85	57	680
Crumpsall .....	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Blackley .....	29	11	13	5	19	41	31	56	67	58	33	42	57	53	124	639
Harpurhey .....	55	60	60	170	191	342	253	346	327	169	129	70	92	14	7	2285
Moston .....	22	12	74	89	148	193	225	263	248	282	179	78	109	156	222	2300
Newton .....	40	20	10	30	65	140	96	136	134	110	90	211	167	230	193	1672
Bradford .....	36	39	49	21	65	67	198	91	103	198	47	239	29	40	7	1279
Beswick .....	2	8	15	8	...	97	118	128	98	119	175	94	...	15	...	877
Clayton .....	6	61	6	9	39	111	152	161	229	234	164	104	107	113	103	1599
Ardwick .....	4	34	25	59	177	261	192	295	361	145	110	109	171	13	45	2001
Openshaw .....	177	169	65	15	60	69	71	152	119	182	80	190	145	155	91	1740
Gorton (West).....	178	110	30	2	2	20	87	236	178	57	...	...	...	50	38	988
Rusholme and Kirk..	51	37	76	89	211	277	294	354	486	462	288	346	258 122	453	261 95	4160
C.-on-M. ....	26	97	97	88	18	36	46	57	1	32	48	27	12	15	5	605
Hulme.....	...	2	1	1	...	29	24	4	3	2	4	1	6	...	1	78
Moss Side .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	364	364
Withington .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	362	362
City Totals .....	682	1093	669	777	1083	1974	2206	2743	2712	2308	1686	1744	1561	1652	2204	25094

\* NOTE —Including 64 Dwelling-houses belonging to Sanitary Committee and 1 Lodging-house.



B.—NEW HOUSES CERTIFIED IN OUTSIDE DISTRICTS FROM 1891 TO 1905.

DISTRICTS	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905
Salford.....	...	254	564	454	613	883	872	1268	885	674	818	733	603	599	619
Eccles .....	141	164	109	100	118	113	165	219	202	215	215	185	244	226	323
Stretford .....	30	43	38	274	356	313	355	340	262	265	320	329	379	483	365
Urmston .....	73	45	42	34	80	102	135	88	43	18	21	24	35	106	90
Withington Urban District Council :															
Withington, including Whalley Range	23	31	17	50	70	79	162	171	225	169	59	52	35	139	211
Didsbury .....	31	42	33	26	79	55	45	66	139	66	37	34	43	68	23
Burnage... ..	...	...	26	21	...	1	24	13	1	14	14	59	1	...	...
Chorlton-cum-Hardy ...	81	63	10	37	94	155	182	152	55	191	220	182	247	215	128
Moss Side.....	...	...	...	...	...	...	...	119	35	403	400	314	157	234	364
Levenshulme .....	...	...	...	...	...	...	...	224	290	420	180	236	278	318	328
Droylsden .....	...	...	...	...	...	...	...	126	36	41	43	...	135	50	33
Gorton .....	...	...	...	...	...	...	...	397	411	352	353	187	402	362	391
Totals.....	379	632	839	996	1410	1701	1910	3183	2584	2828	2680	2335	2559	2800	2875

The whole question of housing will demand comprehensive survey, and must be referred for the time.

FIRST ANNUAL REPORT OF THE MIDWIVES  
SUPERVISING COMMITTEE ON THE WORK  
DONE DURING 1905 UNDER THE MIDWIVES  
ACT, 1902.

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STATEMENT BY THE MEDICAL OFFICER OF HEALTH.

This important Act was framed to secure the better training of midwives and to regulate their practice. Considering that between 10,000 and 11,000 Manchester births took place in 1905 under the care of midwives, it will be readily understood that this is a very large undertaking.

An account was given of the Act in the Annual Report for 1904, and it is not necessary again to go fully into detail.

The Administration set up under the Act consists of a Central Midwives Board and of Local Supervising Authorities, the local authorities being County Councils and County Boroughs.

The functions of the Central Midwives Board under the Act are to keep a register of certified midwives, which consists of existing midwives admitted to the roll prior to April 1st, 1905, and of persons afterwards admitted by examination.

The Board appoints examiners, and defines the course of instruction which they must receive, which includes a course given by a competent instructor, and practical attendance on 20 labours, as well as the nursing of 20 lying-in women during the first ten days after labour, under supervision satisfactory to the Board.

It is evident that on the careful selection of the institutions qualified to give instruction, and of the persons authorised to give the prescribed course, and to supervise the labours and nursing, will depend largely the efficiency of the future midwife. Especially will this be so if the examiners require a uniform and fairly high standard of proficiency. The Local Supervising Committee has, for example, the right to congratulate the Board in their recent decision to exclude illiterates from their examinations. In this matter the Local Supervising Authority is just as much interested as is the Central Midwives Board.

Their approval of the sanitary condition of any institution permitted to give instruction should be a *sine qua non*,

In my opinion, also, it is highly desirable that some part of the practical work should be done in the homes of poor people, so that the persons under training may learn how to adapt their teaching to unfavourable conditions, and also that their instructors may be able to gauge how far they have assimilated the principles of antiseptis.

I have ventured to urge that the Central Midwives Board should publish a statement of any institutions and officers authorised to give instruction, and that the Local Supervising Committees should be requested to make an annual report on the work of any teaching institutions in their district, so that they may have authority and occasion to interest themselves in this matter, which is, to them, of fundamental consequence.

It is surely suitable that they should, at least, be apprised of the sanction given by the Board to institutions in their district to give instruction to midwives.

The Central Midwives Board were directed, under the Act, to frame rules regulating, supervising, and restricting, within due limits, the practice of midwives.

The rules framed by the Central Midwives Board, in so far as they deal with the above subject, form a code which, if observed by midwives, should go far to revolutionise midwifery practice, and to prevent the unfortunate results of ignorance and carelessness which prevailed before the Act came into force.

They direct, in a large number of conditions affecting the pregnant and lying-in woman, as well as the child, which are specifically set forth, that the midwife must decline to attend alone, and must advise that a medical practitioner be sent for.

A form is prescribed on which the midwife states the occasion which, in her opinion, requires medical assistance, and a member of the household is to take this to the practitioner called in.

A copy of this form must be sent off to the Local Supervising Authority within twelve hours.

Failure to carry out this requirement is to be regarded as a serious offence, since it is the function of the Board to decide upon the removal from the roll of the name of any midwife disobeying the rules and regulations laid down under this Act by the Board.

The circumstances under which the midwife is to call in a practitioner have been framed with great skill, and cover practically every important occasion on which danger threatens either the woman or her infant.

In this way the practice of midwives is submitted to a very effective control, both by medical practitioners and by the Local Supervising Committee.



Objection has been raised to the requirement that the midwife shall decline to attend alone. But, surely, this is fundamental. There are many occasions on which it would be most improper for the midwife to assume responsibility unless absolutely forced to do so.

If she is not obliged to decline to attend alone, her advice to the householder to call in a medical practitioner is, in a great many instances, not likely to be taken; and however much she may wish to throw off onerous duties beyond her powers, she will be unable to do so without running the risk of losing her connection.

There is the further danger that rash persons will lightly take the most serious and improper risks. By declining to attend alone, she does not thereby leave her client unprotected, as she is obliged by the rules to remain in charge until the doctor arrives after the second stage of labour has commenced. Provision of the same kind could be made for other emergencies.

Another matter which deserves consideration is the judicial position of the Board. When a Local Supervising Authority finds a *prima facie* case of malpractice, negligence, or misconduct against a midwife, they must report it to the Central Board.

Apparently, the Board considers the evidence relative to the case, and either finds the charge not established, or, having found that there is a case, censures the midwife or strikes her name off the register.

It may be taken for granted that difficulty will be experienced by Local Supervising Authorities in determining what cases come under those respective heads, and that, having sent a case up to the Board, they will be interested to know on what grounds the decision arrived at has been based.

It would be an advantage if the Board would publish an account of typical cases which they consider to have come under the respective heads.

In sending up a case, the Local Supervising Committee are, naturally, obliged to state on what grounds the charge is made. Would it be asking too much of the Board that they should give a brief statement of the grounds on which their decisions, which are of widely different import, are founded?

Theoretically all breaches of the rules of any importance and most of them are important, should be sent up to the Board. Practically the tendency is to deal locally with all but very serious cases, especially, at first. It is desirable that any reluctance to present cases should be reduced as far as practicable.

**The essential functions of the Local Supervising Authority may be briefly outlined, thus:—**

1. To hold meetings, receive and consider reports from their officers, decide on cases reported to them of breach of the

rules—whether they will deal with them or send them up to the Central Midwives Board—to suspend midwives, and remove suspensions under Rule F.

2. To consider important matters arising under the Act.

3. To carry out the Act and the rules framed under them through their officers.

Their Executive Officer is to visit midwives systematically and irregularly, inspect their homes, dresses, and bags of appliances, take note of their personal cleanliness, see that they understand the rules sufficiently to be able to carry them out, that they understand antiseptics and how to use them, and that they can take the pulse and temperature.

She is to inspect their records, and see that they are properly kept.

She is to take charge of the notifications of stillbirths, of deaths in women or child before a medical practitioner is called in, of puerperal fevers, and of other infectious diseases.

She is to inspect the mode of practice of midwives as occasion offers.

On all necessary occasions she must make enquiries with regard to any case in which a midwife has advised that a medical practitioner be sent for.

She records all breaches of the rules found.

She has to investigate any case of puerperal fever arising in the practice of midwives, or any suspicious case pointing to puerperal fever.

Much of the above is, of course, clerical work, but the bulk of it falls on the Executive Officer.

To carry out these weighty duties, the City Council on August 3, 1904, appointed a Special Committee consisting of members of the Council, with the addition of four members of the medical profession not on the Council. Of this Special Committee, Dr. Chapman was elected Chairman. The four co-opted members are Drs. Ernest Annacker, Margaret Bell, Arnold Lea, and Frederick Charles Scotson.

In carrying on the duties devolving on the Committee, they were of opinion that a Medical Executive Officer should be appointed to work under the Medical Officer of Health. This position was accordingly advertised, and Dr. Margaret Merry Smith was appointed on January 4th, 1905. She will explain how the work of the Supervising Authority has been carried out by her.



It was arranged in March, 1905, that the clerical work of the Committee should be carried out by Mr. Dunks, of the Public Health Office.

On January 26th, 1905, the Midwives Supervising Committee appointed the Medical Members of the Committee a Sub-Committee to consider draft instructions to midwives, as it was thought advisable to supplement the rules of the Board by specific directions in a number of particulars.

The Sub-Committee bestowed much pains on the drafting of these instructions, of which copies may be obtained from the Scientific Press Company, London.

They also prepared instructions to midwives on the care of infants during the first ten days.

There is reason to believe that these instructions have been very useful.

The Medical Sub-Committee also visited and inspected the Chorlton Union Hospital, application having been made by the Guardians for that hospital to be recognised as a Training Institution for Midwives.

A report was made to the Committee, and forwarded to the Central Midwives Board, stating that with certain alterations the hospital appeared suitable for the purpose mentioned.

The Sub-Committee also bestowed a considerable amount of time in considering the question of fees to be paid to medical practitioners called in under the rules, and in the determination of necessary details.

A useful bag of appliances was devised by Dr. Merry Smith.

During the year 1905 the Committee, which is summoned at the call of the Chairman, held ten meetings, whilst the Medical Sub-Committee have been called on eight occasions.

There are some points in connection with the work of the Local Supervising Committee on which a few remarks may be needful.

First, as regards suspension. It is the custom in Manchester to suspend midwives in all cases when puerperal fever has occurred in their practice. If, on the report of Dr. Merry Smith, it appears that the midwife understands the rules, is able to carry them out, and has carried them out, the suspension is removed as soon as the midwife has taken the necessary precautions. Until, however, these conditions are fulfilled the suspension is not removed. The Committee have authorised the Medical Officer of Health to act for them in the matter of suspension in cases which arise between meetings. Reports are, of course, made to the Committee at their next meeting. If the midwife cannot or will not carry out the rules, the suspension continues *sine die*. Moreover, under Rule F, suspension is resorted to under conditions other than the occurrence of puerperal fever if a midwife contravenes the directions for the use of disinfectants and for the employment of proper safeguards against the spread of infection.



Considerable difficulty has arisen with regard to the notification of puerperal fever by medical practitioners under the Notification Act.

Unreal distinctions have arisen in medical nomenclature from the use of such terms as Sapræmia, Parametritis, and so forth. I do not mean that such terms have not a legitimate use, but that they are a refuge under apparent failure to notify cases of puerperal fever. One may quite admit that no definition of puerperal fever will cover all cases. But any useful definition will get rid of ambiguity, and will include the earlier stages of sepsis, as well as the slighter forms.

Accordingly, a definition was adopted from the rules of the Central Midwives Board, and the following letter was addressed to practitioners in Manchester:—

Public Health Office,  
Town Hall, Manchester,  
8th May, 1905.

Dear Sir,—I am instructed by the Midwives Supervising Committee to send you herewith a copy of instructions which the Committee of the Manchester City Council are distributing to midwives in connection with the Midwives Act, 1902, and the Rules of the Central Midwives Board framed under that Act.

The Committee are hopeful that you will use your best efforts to see that the midwives with whom you come into contact understand and carry out the measures advised in the instructions.

May I also ask you to carry out the Notification of Infectious Diseases Acts in so far as concerns the notification, as early as possible (forthwith), of cases of puerperal fever coming under your care.

Even in the absence of rigors, headache, pain in the abdomen, foul-smelling discharges, phlebitis, or other signs, a case should be notified as puerperal fever if at any time during the first fourteen days after confinement the temperature rises and remains for twenty-four hours above  $100\cdot4^{\circ}$  F., the pulse being at the same time accelerated, unless the fever can be accounted for otherwise than as resulting from affection of the pelvic organs.

It is likely, judging from what happens in the case of other infectious diseases, that puerperal sepsis is spread from slight cases to which hitherto but little attention has been given.

Yours faithfully

*Medical Officer of Health.*

I cannot say that, at first, this letter had any effect worth mentioning, but there are signs that opinion on the subject will alter.

I next obtained the valuable advice of Mr. W. H. Power on the subject, who referred me to the conclusion arrived at by a Committee of the Royal College of Physicians: "That this Committee is of opinion that with a view to the limitation of dangerous infectious diseases the London County Council would be acting rightly in adopting the view that the expression 'puerperal fever' as contained in Section 55 (8) of the Public Health (London) Act, 1891, should be taken to include septicæmia, pyæmia, septic peritonitis, septic metritis, and other acute septic inflammations in the pelvis occurring as the direct result of childbirth."

This opinion, however, does not help very much in the practical administrative difficulty. The position of the medical practitioner would be that he did not recognise any of these formidable occurrences, and believed he was dealing with a sapræmia which would pass off, or perhaps that he could not arrive at a diagnosis. Where membranes are retained, the most formidable sepsis may appear a sapræmia. At all events there is delay, perhaps fatal, before he makes his mind up.

I again brought the difficulty before the North-Western Branch of the Society of Medical Officers of Health at their meeting on December 15, 1905, when a Sub-Committee, including Sir W. J. Sinclair, was appointed to see whether a working definition could not be arrived at.

Largely under his advice, the following definition was adopted:—

"For the purpose of the Notification Acts, 1889 and 1899, the term 'puerperal fever' shall include all cases in which, within seven days after the birth of a child, alive or stillborn, the mother shall have a rise of temperature exceeding 100.4. F. with quick pulse, maintained for a period exceeding 24 hours, without any obvious cause other than the puerperal state."

"It shall also include all cases in which, within seven days after the birth of a child, there has been the occurrence of rigor (with attendant illness) without any obvious cause other than the puerperal state."

It is intended to place this definition before the medical practitioners of Manchester for general adoption as a working definition. It is necessary to observe that the elevated temperature with quick pulse, and the occurrence of rigor, are to be regarded not as together constituting puerperal fever, but as offering alternative bases for diagnosis.

Further, although this definition may be offered as an aid to simplify diagnosis and notification, it might be defeated by failure on the part of

midwife to take the pulse or temperature, or to enquire into the symptoms of the lying-in woman.

In case of continued failure to get notification of cases which we must regard as puerperal fever, the ultimate resort must be to a Court of Summary Jurisdiction, however reluctant one may be to take that course.

Since the beginning of 1905 no case of death in a woman recently confined can escape our attention, and we may hope to effect much good by examination of the death registers, and by inquiry into all deaths in women of child-bearing age.

Several deaths of lying-in women have in this way been found, and submitted to investigation.

In the same way, by the courtesy of the Parks and Cemeteries Committee, and of the Registrars of Cemeteries in Manchester not under their management, the Midwives Supervising Committee receives a list of all stillbirths registered, so that a check is imposed on any attempt to evade sending in the statutory notification.

In an earlier part of this report stress was laid on the importance of the training to be given to intending midwives. But no less important is the instruction given to existing midwives by the Executive Officer for the success of the Committee's work.

It will probably be advisable to subject uncertified women, who continue to practice, to examination and instruction. This should be explicitly enjoined in amended rules.

In my opinion much valuable work has been done in Manchester under this Act, which, as it stands, has been found here to be quite workable, though no doubt it is susceptible of amendment.

On December 20th, 1905, a letter was received from the Central Midwives Board asking for suggested Amendments of the Rules, and the following were submitted by the Committee:—

#### SUGGESTIONS IN CONNECTION WITH THE RULES OF THE CENTRAL MIDWIVES BOARD.

*Insert—*

(Rule C 1 (1). Add:

Not less than five of these labours must be in the homes of the persons confined. The value of the midwife's experience would be much enhanced by this addition.

Rule E (2) a :

The appliance for giving vaginal douches must be distinct from the appliance for giving enemata, and must not be allowed to come into contact with it.



## Rule E (4) :

All instruments and appliances brought into contact with the patient's generative organs must be properly disinfected directly before and directly after use.

## After Rule E (5) :

By "Puerperal Fever" is meant? (giving a definition for working purposes )

## Suggested to precede Rule E 6 :

A midwife must not leave a lying-in case under her charge after the commencement of labour, except under the charge of a certified substitute, without leaving plain directions in writing as to where she is to be found, and providing means whereby she may be at once recalled.

## After Rule E (7) :

On the conclusion of labour, the midwife shall cleanse and disinfect the external parts.

## After Rule E (8) :

A midwife must not insert her hand or fingers into the uterus to aid the expulsion of the placenta, nor must she pull at the cord for the same purpose.

Only in case of severe post partum hæmorrhage is she at liberty to detach the placenta with her fingers, and then after very careful disinfection of her nails, hands, and arms.

## After Rule E (9) insert :

The midwife in charge must, in all cases of labour, examine the placenta and membranes before they are destroyed, and must satisfy herself that they are completely removed.

## After Rule E (12) might come the following :

When called in to attend a woman in labour, and at every subsequent visit, the midwife shall take the pulse and temperature, and record them in a book, which she must produce when called upon to do so by the accredited officer of the Local Supervising Authority.

Rule E (17) before the words "decline and advise" insert "at once."

Thus :—

In all cases of abortion, of illness of the patient or child, or of any abnormality occurring during pregnancy, labour, or lying-in, a midwife must *at once on becoming aware of the condition* decline to attend alone,

and must *at once* advise that a medical practitioner be sent for, as, for example, under the following circumstances :

After Rule E 17 B (4) :

If, on examination of the placenta and membranes, the midwife is of opinion that they have not been completely expelled.

Supply letter "e" after rule E 17 d, before the words "when a registered medical practitioner."

Rule E (17) (d). It is desirable to add :

The reason for calling in medical aid should, whenever possible, be stated in precise terms, and should follow the wording of the previous sections of Rule E (17).

(Many of the reasons given are very vague and general.)

At the end of the rules add:—"On any change of address, the midwife shall within 48 hours of removal notify her new address to the Supervising Authority of the District from which she has removed."

Rule E (19) (a). After "*Date and hour of Midwife's arrival*" add "*and departure.*" Next heading: *Date and hour of birth of child.*

Midwives Act, 1902, Section 8 (2) :

It is desirable that the meaning of the terms "malpractice," "negligence," and "misconduct," should be indicated by examples.

It may be pointed out also, that, beyond bringing a midwife before them, the Local Supervising Authority have no power to deal with disobedience or neglect of any of the many Rules E.

The rules should indicate how far it is intended that offences under the rules shall be dealt with, not by the Local Supervising Authority, but by the Central Midwives Board.

\* \* \* \* \*

The most arduous task which the Committee has had to perform has been the consideration of the claim that medical fees should be paid to practitioners called in under the Act on the advice of midwives.

The subject has been discussed at a number of meetings both of the Medical Sub-Committee and of the General Supervising Committee. Deputations were received from the Medical Guild and from the Local Branches of the British Medical Association, and the subject was also discussed at a Conference between the Committee and representatives of the last-named bodies, held in the Town Hall on February 22nd, 1906, when an understanding was arrived at embodied in the following resolutions :—

#### Resolution No. 1.

That an amendment of the Midwives Act, 1902, with a view to settle the question of payment of fees to medical practitioners under the rules

of the Central Midwives Board called in on the advice of midwives is one of urgency, and that in the opinion of this Conference a speedy amendment of the Midwives Act dealing with the matter is called for ; further, that the Parliamentary Sub-Committee\* of Manchester be requested to arrange for the subject to be brought before the Municipal Corporations' Association with a view to speedy legislation.

Resolution No. 2.

That any mode of payment by the Corporation of Manchester at the present time is to be regarded as temporary, and merely preliminary to general legislation.

Resolution No. 3.

That having regard to the great likelihood of general legislation being adopted in this matter at an early date, it is desirable at the present time merely to deal with emergency cases under Rule E 17 (B) and (C) 1, sections 1, 2, 3, 4, and 5.

Resolution No. 4.

That, for the present, medical practitioners in default of payment by the patient should apply to the Corporation under the Public Health Act, 1875, and any other powers which the Corporation may possess. The Corporation should then enquire into the circumstances of the family, and defray the fee in all cases in which the income of the family does not exceed a certain standard rate, depending on its numbers.

The Central Midwives Board have memorialised the Privy Council to amend the Act with a view to the payment of medical fees. It is evident that if fees are to be paid it should not be left to Local Authorities to adopt each their separate methods of procedure. The British Medical Association have also advocated amendment of the Act for the same purpose.

So far as I am aware, only two Authorities—viz.: those of Liverpool and Cardiff—have hitherto adopted any scheme of payment, and their schemes, it is understood, are purely temporary.

The legal sanction for the payment of fees rests at present on Section 2 of the Poor Law Act of 1848 and on Section 133 of the Public Health Act, 1875. The system adopted in Liverpool makes use of both Acts. But, as will be seen on reference to the resolutions already mentioned, the Manchester proposals rest purely on the Public Health Act, 1875, and relieve the Guardians of all responsibility in the matter.

At the instance of the Supervising Committee, the Manchester City Council applied to the Local Government Board for sanction to pay medical fees under

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\* The matter was referred by this Committee to the Town Clerk, who brought the subject before the Association, and it is now under the consideration of their Law Committee.



Section 133 of the Public Health Act, 1875, and this sanction was granted on April 5th, 1905. The City Council thereupon resolved that such fees be paid, the maximum fee not to exceed £1 1s.

Under the Public Health Act, payment can only be made in respect of the poorer members of the community.

Before the resolution of the City Council could be carried into effect, it thus became necessary to devise a scheme defining poorer persons, delimiting the cases determining the conditions under which fees should be paid.

The definition of poorer persons adopted by the Supervising Authority is as follows :—By poorer persons shall be understood those whose incomes from all sources do not exceed :

Man and wife .....	21/-	per week.
Parent or parents and 1 child .....	23/-	„ „
„ „ „ 2 children .....	25/-	„ „
„ „ „ 3 „ .....	27/-	„ „
„ „ „ 4 „ .....	29/-	„ „
„ „ „ 5 „ .....	30/6	„ „
„ „ „ 6 „ .....	32/-	„ „
„ „ „ 7 „ .....	33/-	„ „

It becomes necessary to ascertain the incomes of persons in respect of whom application is made. The District Provident Association are willing to undertake this work at a very moderate charge, and no additional staff will be required.

The cases in which payments will be made are defined by the resolution already given.

The conditions under which payment will be made have been defined by the Supervising Committee and adopted by the City Council in the following terms :—

A fee of £1 1s. to be paid for all contingencies provided for in Section 17b of Rule E; for cases of puerperal fever, and for cases of secondary postpartum hæmorrhage, Section 17 C (3). Under Section 17C of Rule E, a fee of 5s. to be paid for attendance on the advice of a midwife, in consequence of each or all of the occurrences 1, 2, 4, and 5, unless the case should be diagnosed as puerperal fever, when a total fee of £1 1s. will be paid.

These payments to be made contingent on a report being furnished by the medical attendant to the Midwives Supervising Committee when so requested, on a form to be provided in each case by them, of facts within the knowledge of the medical practitioner which may appear to the Authority necessary to the elucidation of the case.

They will also be contingent on the carrying out by the medical practitioner at the earliest possible moment of any procedures arising out of the visit, for which the sum of £1 ls. will be considered an inclusive charge.

All cases, in fact, to be treated as cases of emergency by the medical practitioner called in.

This arrangement is to be regarded as purely temporary until the payment of medical fees has been dealt with by general legislation, and the Corporation, while deeming it expedient to pay these fees in the interest of poorer persons, and for the prevention of disease, cannot admit that any claim exists against them. This was clearly explained by the Chairman of the Committee at the Conference on February 22nd, 1906.

The arrangement will come into force directly after the Estimates for the year have been passed by the City Council.

An important question arises in connection with cases of puerperal fever as to the course to be pursued upon the notification of a case. During the last year 39 cases have been received from the City, as apart from the Royal Infirmary, in Monsall Hospital, and have there been treated by Dr. Gordon. The results attained appear to show that the cases do better in Monsall Hospital than they do when treated at home.

Whereas out of 29 cases treated at home 10 died ; out of 39 treated at Monsall Hospital, only 10 died ; of 14 treated at other institutions, 5 died.

The figures are too small and the conditions too uncertain to base any general conclusion upon them, but, at all events, the results obtained in Monsall Hospital must be regarded as very favourable. As an example of the elements of uncertainty existing, it may be pointed out that there is strong reason for believing that many cases which recover at home do not come to the knowledge of the Health Department.

Where the requisite skill can be obtained, there can be no doubt that the Fever Hospital is a suitable institution in which to treat cases of puerperal fever, and it is to be hoped that the high proportion sent into Monsall Hospital will continue.

As regards the result of the Committee's labours, this must be regarded as good, from whatever point of view it is looked at.

The improvement in the midwives is evident and great, though much still remains to be done,

In spite of the increased number of cases of puerperal fever notified in 1905—viz., 79, as compared with an average of 50 in the last ten years—the death-rate from puerperal fever did not increase, but, on the contrary, was under the average of 10 years.

In calculating the death-rate, cases ascertained through the death registers, and interpreted as puerperal fever, have been included to the number of 5. Thus the death-rate, if interpreted in the usual manner, would have been .03, but, with the addition of these 5 deaths, became .04 as compared with an average of .05 in the previous ten years.

The death-rate in 1905 was, however, the same as in 1904 so far as the number of deaths certified in the usual manner is concerned.

Taking all things into account, we may conclude that the real death-rate in 1905 was the lowest yet attained. How far this result is due to the teaching and supervision of Dr. Merry Smith and to the control exercised by the Committee, how far to treatment at Monsall Hospital, cannot as yet be seen, and may be left to the future to settle.

In conclusion, I would express my conviction that, if all the matters mentioned in the rules are to be adequately supervised, one officer cannot overtake the work, and another will be required in the near future.

For Dr. Gordon's Report on the treatment of Puerperal Fever see page 265.

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STATEMENT BY THE EXECUTIVE OFFICER, MARGARET MERRY SMITH,  
M.B., CH.B., D.P.H. EDIN.

My duties in connection with the Midwives Act began in Manchester in February, 1905. The provisional statement of the duties of the executive officer drawn up by the Midwives' Supervising Committee, which I now submit, excellently summarises its scope:—

*Provisional Statement of Duties of the Executive Officer under the  
Midwives Act, 1902.*

To visit midwives, both systematically and irregularly, and see that their homes are kept in a sanitary condition.

To inspect their case or bag of instruments.

To ascertain that they have a supply of soap, antiseptics, and antiseptic lubricants.

To inspect their case books, and ascertain that they are properly kept.

To ascertain that they are suitably provided in washable dresses.

To ascertain that they understand the use of antiseptics; and the antiseptic precautions which they are required to adopt.

To ascertain that they have entered in a book any treatment by drug which they may have considered necessary.

To inspect the record of those instances in which they have called in practitioners.

To ascertain that in all the cases prescribed by the regulations a midwife has declined to attend alone, and has advised sending for a registered medical practitioner.

To take charge of the notifications of deaths, stillbirths, and puerperal fever, and to carry out any action which the Committee or the Medical Officer of Health may consider to be called for in connection with such notifications, with the assistance of the Registrars of Cemeteries, to ascertain that the notification of stillbirths is properly carried out. He may be required to make post-mortem examinations.

To visit the cases attended by midwives and see that the requisite procedures are carried out, and that strict cleanliness in all things is observed.

To ascertain that suitable provision is made for the dieting of mother and child.

To ascertain that all the duties of the midwife to mother and child as prescribed by the regulations are properly carried out.

To see that all necessary precautions are taken by the midwife when a case of puerperal fever occurs.

To report any offences against Section 1 (Sub-sections 1 and 2), Section 1 (Sub-Section 4), Section 1 (Sub-section 5), Sections 10, 11, 12, and 13.

Generally the Executive Officer will be required to exercise supervision over midwives in all matters relating to Section E of the regulations.

The officer will be required to keep a book in which all visits and any action taken will be recorded.

*General Statement of the Work of the Executive Officer.*

The work may be roughly divided into two branches—inspection and clerical

Most of the Executive Officer's time is taken up with actual inspections, but the clerical work is by no means inconsiderable. It entails preparation of reports for the Midwives' Supervising Committee and the Medical Officer of Health in all cases of puerperal fever, in cases where a midwife is found guilty of malpractice, negligence, or misconduct, or where she contravenes the rules of the Central Board. Registers with full particulars of all the inspection visits to midwives in their homes, and special investigation forms in all branches of the work are kept.

The most important departments of the inspection work were first developed. It was essential that I should become acquainted with the midwives and the conditions under which they worked. Inspection visits to midwives in their own homes were therefore carried out systematically. Only investigations into puerperal fever cases, and medical records which had reference to these, were allowed to interfere with the routine.

It was at first only possible to make two or three such inspection visits daily, owing to the lengthy duration of each. A routine method was adopted : attention was first paid to the sanitary condition of the house ; next to the condition of the midwife's bag of appliances, registers, clothes, and personal appearance ; and, lastly, definite practical instruction was given in the rules of the Central Midwives' Board, in the value of cleanliness, and in the intelligent use of antiseptics. Return visits were paid where necessary, until the midwife attained a fair working standard of efficiency.

Where the conditions revealed on inspection were unsatisfactory, or the midwife refused to comply with suggested improvements, a report was presented to the Medical Officer of Health, and later to the Local Supervising Committee. Action was usually taken in these cases either by suspending the midwife from practice, where such a course was possible, or by censuring her at the Committee Meeting which she was summoned personally to attend.

During these visits the attempt was made to gauge the personality of the midwife, to enlighten her as to the real purpose of the Act and all the requirements of the rules, so that in future she could intelligently carry out their requirements. Midwives were also encouraged to consult the Executive Officer in all circumstances in which they were doubtful regarding the new regulations.

Some of these first visits were by appointment, owing to the loss of time otherwise entailed. Subsequent visits have, however, all been surprise ones. During these subsequent inspection visits the same routine method is adopted. One special rule of the Central Midwives' Board forms the chief subject of discussion, however. It depends on the intelligence and capacity of the midwife whether the value of cleanliness and the method of using antiseptics must again be clearly outlined, or whether other branches of the work may be discussed.

Investigation of all puerperal fever cases and of medical records bearing on this subject have been carried out systematically. It has been impossible, through lack of time, to investigate in every case the midwife's mode of practice for some time before and after the case of puerperal fever which occurred in her practice. In almost every case where this has been done valuable information has been obtained.

When a case of puerperal fever occurs the midwife is suspended by the Medical Officer of Health, acting for the Midwives' Committee, and the Executive Officer personally supervises the disinfection as described in the puerperal fever report. (See pages 251-256.)

When the midwives had all received at least one inspection visit the systematic investigation of stillbirths and deaths of new-born children occurring in their practice was undertaken.

This was continued until the end of the year, but, as it was considered that systematic inspection of the midwives while at their work, was at present more important, it had to be given up.



Two hours on Saturday morning are reserved for midwives to consult the Executive Officer, at the Health Office, if they so desire. Many have availed themselves of this opportunity.

In all cases of difficulty the Executive Officer has consulted with the Medical Officer of Health, and many cases have required both consideration and promptitude. The work done by the Midwives' Committee and the officers has so far been largely educational, and ample opportunity has been given to midwives, through pamphlet distribution on matters pertaining to the Act and rules, and through individual attention, to make themselves fully acquainted with the new requirements. No attempt has been made to do any systematic work among the handy women, although some have been visited. There are comparatively few in Manchester, and parturient women are not dependent on them, so that they have been left over until the work prescribed by the rules has been put on a solid footing. Women who were not on the Midwives' Roll, but continued to display notices calling themselves midwives after April, were visited and requested to remove such notices and to discontinue the use of the title. All complied with the request.

Reports of all cases of puerperal fever where midwives are in attendance, of all charges of malpractice, negligence, or misconduct, or of any other special business, are submitted to the Midwives' Supervising Committee at their monthly meeting. By request, special reports concerning their staff midwives have occasionally been sent to the Lying-in Hospitals.

Before proceeding to describe in detail how these executive duties have been performed, I will first give particulars relating to midwives practising in Manchester.

#### STATISTICS RELATING TO MIDWIVES.

There are at present 151 midwives practising in Manchester; 15 of these reside without the City. The majority are married women under 55 years of age, and many devote their whole time to midwifery work.

The following table gives particulars relating to midwives practising in Manchester, and sets forth their qualifications prior to entry on the Midwives' Roll. It will be seen that more than 50 per cent. are certificated midwives.

This table contains a number of facts relating to puerperal fever which are not required at this point, but will be referred to later on :—

TABLE A.—PARTICULARS RELATING TO MIDWIVES PRACTISING IN MANCHESTER.

Qualification	Bonâ-fides	St. Mary's Hospital	Maternity Hospital	London Obstetric Society	Queen Charlotte Hospital	Liverpool Lying-in Hospital	Rotunda Hospital	TOTAL	Column
Total number of midwives appearing on register .....	74	39	22	34	1	3	1	174	1
Number removed from Manchester area...	4	1	2	4	...	...	...	11	2
Number ceased practising entirely .....	8	...	1	...	...	...	...	9	3
Number suspended <i>sine die</i> .....	3	...	...	...	...	...	...	3	4
Number still practising who reside in Manchester.....	50	33	19	29	1	3	1	136	5
Number residing outside Manchester, but practising within the City.....	9	5	...	1	...	...	...	15	6
Number of births attended by midwives under the heading given .....	2780	3082	2047	2099	72	150	3	10233	7
Number of cases of puerperal fever attended by midwives under the heading given .....	13	19	7	12	...	...	...	51	8
Deaths amongst cases of puerperal fever attended by midwives .....	2	5	3	4	...	...	...	14	9
Per cent. of puerperal fever amongst all cases attended .....	0.47	0.62	0.34	0.55	...	...	...	0.50	10
Per cent. of puerperal fever amongst cases attended by midwives having puerperal fever in their practice .....	1.55	0.82	0.91	1.11	...	...	...	1.08	11
Number suspended on account of puerperal fever .....	9	8	3	7	...	...	...	27	12

Table B shows the distribution of midwives in sanitary districts, stillbirths attended by midwives, the total births registered, and the cases of puerperal fever occurring in each district.

1905.

TABLE B.—SHOWING THE NUMBER OF BIRTHS AND STILLBIRTHS IN DISTRICTS. ALSO THE NUMBER OF MIDWIVES RESIDENT IN THE VARIOUS DISTRICTS.

STATISTICAL DIVISIONS	No. of Births Registered	No. of cases of Puerperal Fever*	No. of Stillbirths Notified	Midwives on Register resident in Manchester
City of Manchester .....	18,325	82	263	148
I. Ancoats .....	1,514	5	16	5
I. Central .....	764	6	17	8
I. St. George's .....	1,871	8	32	9
II. Cheetham .....	1,171	4	4	5
II. Crumpsall .....	209	...	...	...
II. Blackley .....	265	2	5	2
II. Harpurhey .....	507	1	7	5
II. Moston .....	359	2	2	4
II. Newton .....	1,109	2	11	11
II. Bradford .....	923	10	18	5
II. Beswick .....	440	2	7	...
II. Clayton .....	349	2	5	3
III. Ardwick .....	1,288	7	24	5
III. Openshaw .....	1,004	5	21	10
III. West Gorton .....	911	3	11	9
III. Rusholme and Kirk .....	765	2	7	12
III. Chorlton-upon-Medlock .....	1,342	8	20	18
III. Hulme .....	2,153	12	45	19
III. Moss Side .....	578	1	6	4
III. Withington .....	803	...	5	14

\* 76 of these occurred after confinement and 6 after abortion

Midwives on Register resident outside Manchester	
Prestwich .....	1
Levenshulme .....	3
Outer Gorton .....	1
Eccles .....	1
Salford .....	8
Droylsden .....	1
Stretford .....	2
Bradford (Yorks.) .....	1
	26
Address unknown .....	5
Removed entirely away .....	3



It has been impossible to classify in districts the births attended by midwives as they do not confine their practice to that in which they reside; 3,150 of these births were attended in connection with the district work of the Manchester Maternity and St. Mary's Hospitals.

The total number of visits to, and interviews with, midwives during 1905 was 538, and the total number of houses visited, on account of cases reported by midwives occurring therein, was 260.

279 inspection visits were paid to midwives at their homes; 9 of these visits were paid to midwives who reside without the City but practice in it. Apart from inspection visits, midwives have been interviewed in connection with the investigations of puerperal fever, medical help records, stillbirths, and deaths of new-born children.

112 interviews have taken place at the Health Office, where midwives are encouraged to come for advice when in doubt regarding the rules.

Some midwives have been visited more frequently than others. Where inspection revealed an unsatisfactory condition of affairs repeated visits were made, and care taken to ensure that a good working standard was maintained.

On the other hand, where midwives were found to be satisfactory further visits were not paid.

#### DETAILS OF THE WORK OF THE EXECUTIVE OFFICER.

The routine method of inspection adopted in each case is as follows :—

##### 1.—Examination of the sanitary condition of the house.

The house is inspected to see that it is clean and sanitary; defects are pointed out and referred to the Sanitary Department, and arrangements are made to ensure future cleanliness where this is necessary.

The ages of the occupants are noted, and special details which will facilitate tracing any spread of infection. The storage room for duty clothes is specially investigated, and the provision of sitz baths, if no fixed ones exist, is insisted upon. Several of the houses were very dirty, and a few insanitary.

##### 2.—Inspection of the bag of appliances.

The lining is examined to see that it is clean and detachable, and all appliances are overhauled.

During first visits it was necessary in many cases to cut out the lining, to disinfect the bag, and also to demonstrate the use of appliances and the method of cleansing and disinfecting them.

At the first visit 22 midwives possessed a complete set of appliances, which were kept in good order.

The remainder either possessed an inadequate supply, or kept the appliances in a dirty condition, and used the bag for any rubbish they chose to carry round.

One young woman, who received a hospital training four years ago, and was carrying on a fairly large practice at the time of the inspection visit, used a small hand-bag with an undetachable lining, which was blood-stained and filthy. The bag itself was soiled throughout. The scissors were blood-stained. The thermometer was broken, and she had no vaginal douche or catheter. She was personally dirty and untidy, and the house was in the same condition.

A surprise visit was paid in February, 1906, to this midwife while at work. She was personally neat and tidy, her appliances were complete and in excellent order, and the care taken of the lying-in woman very satisfactory.

Instruction in the methods of taking the temperature and pulse was found necessary in almost every case.

One midwife, after stating that a patient's pulse and temperature were normal, was asked to demonstrate the method of taking these. She promptly placed the stem end of the thermometer under the tongue, then placed her thumb on the woman's wrist where no artery could be felt, and replied, after consulting glass and watch, that the temperature was 98°F. and the pulse 60. In another case the midwife, who was using a five-minute thermometer, only left it to register for one minute. A temperature of 99°F. was thus recorded though in reality it was 102°F. Only demonstration of the result of leaving her thermometer to register for the required time convinced her that the control thermometer was accurate.

The appliance used by the majority of the midwives to give rectal and vaginal injections was the Higginson syringe. The same syringe was being commonly used without intervening sterilization or disinfection to give enemas, to douche normal or septic cases and cases of emergency anti and post partum hæmorrhage. A separate vulcanite nozzle for the enema syringe and a few crystals of potassium permanganate dropped into the water for the douche were all the preparations required to give a vaginal injection. A vaginal douche can or syphon douche with a glass nozzle has been insisted upon as being part of the necessary appliances, and definite instructions have been given to use the Higginson syringe for giving enemas only, and to carry these in a separate bag.

Midwives were paying a very high price for their bag of appliances. So in accordance with my suggestion Messrs. Woolley & Sons, Manchester, prepared a useful, compact, presentable, and very durable bag. It is made in brown canvas, lined with waterproof material capable of disinfection, or in leather. The shape is rectangular, so that it remains open, and the contents may easily be obtained. It contains two detachable linings and a complete stock of appliances. The brown canvas bag complete costs 23/6, and the leather one 25/-. Many have bought these, but refused to entertain the suggestion that a cheap drill bag would meet their needs.

3.—Examination of the register of cases, medical records, and notifications sent in to the local authority.

Instruction was given where the midwife did not understand the method of book-keeping; where she was unable to write, the relative who undertook the task was instructed.

4.—Inspection of washing dresses and aprons.

Suitable provision of these is insisted upon, and where gloves are worn these must be washable. Care is taken to secure convenient storage for the clothes.

5.—Examination of the general appearance of the midwife and the condition of the hands.

The midwife is urged to take a bath at least twice a week and to keep her hair well washed. A particular examination is made of her hands and nails. She is encouraged to keep them in good order and to take precautionary measures against chapping of the hands.

6.—Verbal examination of the midwife's mode of procedure while in attendance on lying-in women.

During this examination a provisional estimate is formed of the midwife's knowledge of the conduction of labour and of the care of lying-in women and new-born children. It is also possible to find out what cleansing and antiseptic precautions she considers necessary while in attendance on them.

7.—Examination in the rules of the Central Midwives' Board.

8.—Full instruction is given regarding the requirements of the Midwives Act and rules.

Where the midwife was found to lack the necessary appliances or clothing, or had not a good working knowledge of the rules, a return visit was paid in about a week to see that the instructions given had been carried out. In the interval she often came to the Health Office for further help and tuition.



If the midwife was very unsatisfactory, her knowledge throughout inadequate, her appliances and house dirty, she was promptly reported to the Medical Officer of Health and suspended from work. Twelve midwives were thus dealt with. The duration of the suspension varied. If the midwife was able to learn and obey the rules when further instructed, to provide the necessary appliances and to maintain cleanliness, the suspension was removed early. If the progress was slow, removal was delayed; and if the midwife proved quite incompetent, removal never took place., *i.e.*, "Suspension *sine die*." (Table A, column 4.) A few of the midwives preferred to give up work rather than obey the rules of the Central Midwives' Board. (Table A, column 3.)

#### INVESTIGATION OF MODE OF PRACTICE.

An investigation of the mode of practice of midwives is occasionally carried out as part of an ordinary inspection visit. Twenty-two cases have thus been visited. While the midwife attends to mother and child, simple instructions are given to the mother by the Executive Officer regarding the value of fresh air and cleanliness. Cheap nourishing foods are brought under her notice, and the value of temperance inculcated. After leaving the home, the defects which have occurred in the midwife's practice are pointed out to her, and general instructions given on the hygiene of the home, and on the care of both mother and child. It is possible to accurately gauge the working capacity of the midwife during these visits, which have also revealed the difficulties under which they have to labour. Specially dirty houses have been inspected at the request of the midwife. The sanitary defects in the homes visited are attended to.

An investigation is also made when stillbirths are reported, when a case of puerperal fever occurs in the midwife's practice, or when her registers are unsatisfactory. Sources of infection have thus been traced, early cases of puerperal fever detected, and false entries in registers verified where suspected.

Special forms are used for these investigations, and filed for reference.

Under certain conditions, defined in Rule E 17 of the Central Board, midwives must decline to attend alone, and advise that a registered medical practitioner be called in. They are required to send to the local authority within 12 hours the record of having done so.

These records are filed and indexed under the name of the midwife. The particulars are then entered into a register, and also entered on separate forms for each midwife.

769 records were received during 1905. 192 of these records were in connection with the cases attended by the lying-in charities. In Table C these are classified under the various causes for which medical aid was sought.

TABLE C.—NUMBER OF CASES OCCURRING IN 1905 IN WHICH THE MIDWIFE ADVISED THAT A REGISTERED MEDICAL PRACTITIONER SHOULD BE SENT FOR. (RULE E—17).

	Private Cases	Lying-in Hospital Cases
(a) In the case of a pregnant woman:—		
(1) Where she (the midwife) suspects a deformed pelvis .....	0	0
(2) Where there is loss of blood .....	7	3
(3) Where the pregnancy presents any other unusual features (as, for example, excessive sickness, persistent headache, dimness of vision, puffiness of face and hands, difficulty in emptying the bladder, incontinence of urine, large varicose veins, rupture), or where it is complicated by fever or any other serious condition.....	11	11
(b) In the case of a woman in labour:—		
(1) In all presentations other than the uncomplicated vertex or breech... ..	66	13
In all cases of breech presentation in primiparæ .....	12	3
In all cases of severe flooding or convulsions.....	39	9
Instrumented labour .....	161	35
(2) If the midwife when the cervix has become dilated is unable to make out the presentation .....	0	0
(3) If an hour after the birth of the child the placenta has not been expelled and cannot be expressed (that is, pressed out), even if no bleeding has occurred.....	40	13
(4) In cases of rupture of the perineum or other serious injuries of the soft parts.....	22	20
If the tear extends into the rectum.....	0	0
(c) In the case of lying-in women and in the case of newly-born children:		
I.—The mother:—		
(1) Abdominal swellings and signs of insufficient contraction of the uterus .....	0	0
(2) Foul-smelling discharges .....	0	0
(3) Secondary post partum hæmorrhage .....	4	9
(4) Rigor .....	5	0
(5) Rise of temperature above 100·4 degrees F. with quickening of the pulse for more than 24 hours.....	33	18
(6) Unusual swelling of the breasts with local tenderness or pain .....	6	1
Progress unsatisfactory or complications.....	30	20
II.—The child:—		
(1) Injuries received during birth .....	1	0
(2) Obvious malformations or deformities, not inconsistent with continued existence .....	14	1
(3) Concealed malformations, incapacity to suck or to take nourishment .....	9	0
(4) Inflammation to even the slightest degree of the eyes, eyelids, and ears .....	3	10
(5) Syphilitic appearance of the skin in certain parts .....	2	1
(6) Illness or feebleness arising from prematurity .....	72	17
(7) Malignant jaundice (icterus neonatorum) .....	14	1
(8) Inflammation about the umbilicus (septic infection of the cord).....	1	1
(d) In all cases of the death of a woman during pregnancy, labour, or lying-in .....	0	0
Abortions and miscarriages.....	25	6
Total .....	577	192

Enquiries were only made into special cases where the medical practitioner had been called in because of rise of temperature, quickened pulse rate, rigor, foul-smelling discharge, or other symptoms of puerperal fever. 63 records were thus dealt with. In 15 cases they were subsequently notified as puerperal fever; in 5 cases the illness was regarded as septic in origin.

These records are a valuable means of obtaining the early notification of puerperal fever. They also afford a method of judging the work done by midwives.

PUERPERAL FEVER.

79 cases of puerperal fever were notified during 1905. 73 cases occurred after confinement and 6 cases after abortion. In addition to the notified cases, 3 have been added, of which information was obtained from the death registers. The total number of fatal cases, which includes the cases from the death registers, was 25.

The district distribution of the cases is given in Table B, Column 2.

Table showing the number of cases of Puerperal Fever occurring week by week during 1905, according to date of onset:—

1st Quarter			2nd Quarter			3rd Quarter			4th Quarter		
Jan.	7	.....1	April	8	.....1	July	8	.....0	Oct.	7	.....2
	14	.....1		15	.....0		15	.....2		14	.....3
	21	.....2		22	.....4		22	.....3		21	.....0
	28	.....1		29	.....1		29	.....2		28	.....1
Feb.	4	.....2	May	6	.....2	Aug.	5	.....3	Nov.	4	.....1
	11	.....0		13	.....1		12	.....3		11	.....4
	18	.....0		20	.....1		19	.....1		18	.....1
	25	.....1		27	.....2		26	.....0		25	.....0
March	4	.....2	June	3	.....7	Sept.	2	.....1	Dec.	2	.....0
	11	.....4		10	.....1		9	.....0		9	.....2
	18	.....0		17	.....1		16	.....0		16	.....2
	25	.....1		24	.....1		23	.....2		23	.....2
April	1	.....6	July	1	.....0		30	.....3		30	.....1
TOTAL .....21			22			20			19		



The following table relating to the cases attended either by Midwives or Doctors may be of interest :—

No. of cases attended by		Cases proving fatal	No. occurring from January 1st to June 30th		No. occurring from July 1st to Dec. 31st	
			Cases	Deaths	Cases	Deaths
Midwives alone.....	41	11	17	7	24	4
Doctors alone.....	31	11	21	6	10	5
Midwife and Doctor...	10	3	5	3	5	0
	82	25	43	16	39	9

In 16 cases out of the 25 fatal cases death occurred within a fortnight after the confinement ; the others all died within six weeks.

In 9 of the fatal cases the women were primiparae, and in all they varied in age from 20 to 40. While these figures are too small to yield any definite conclusion regarding the fatal cases, they would seem to indicate that multiparae when affected succumb more readily.

After notification the patients were either removed to Monsall Fever Hospital or remained at home or in other institutions.

The results were as follows :—

Cases treated at	Total No. of Cases	No. Recovering	No. of Deaths	Case Mortality per cent
Monsall Hospital .....	39	29	10	25·6
Home .....	29	19	10	34·5
Other Institutions .....	14	9	5	35·7
Total .....	82	57	25	30·5

The day of onset in 60 per cent. of the total cases occurred on or before the third day.

In 87 per cent. of the total cases it occurred on or before the fifth day, but in the remaining cases it was delayed apparently even as late as the twelfth day. It is open to question whether these late onsets were not more apparent than real. Midwives' and doctors' cases show no difference in this respect.

Thirty-four cases out of the total number were notified within three days after the onset, and in 53 cases within seven days after the onset. The notification in many cases was, however, much delayed; in several cases it occurred immediately preceding the death of the patient. The notification of cases occurring in the practice of midwives was not more delayed than that of cases occurring in the practice of medical men.

In 30 out of the 41 cases where midwives attended alone at the confinement the doctor was called in within 24 hours of the onset. All records of calling in medical aid for any symptoms of puerperal fever were investigated, and 15 cases thus investigated were afterwards notified as puerperal fever.

Thirty-nine of the cases of puerperal fever were primiparae, and in all but three they varied in age from 20—40.

The labour was abnormal in 29 per cent. of the total cases; either instruments were applied or manual interference was required for complications.

The disinfection of the patient before and after labour was in almost every case where a midwife attended alone very perfunctory; the disinfection of the midwife's hands was likewise very inadequate, and in many cases the appliances carried were dirty, and the midwife unreliable.

Frequent examinations were made in most cases, but in six no vaginal examination was made at all. The bed and personal clothing was stated to be very dirty or soiled with faeces in 13 cases, and in these cases the houses were also dirty; otherwise the clothing was apparently fairly clean.

Daily douching after labour had been carried out by many of the midwives in the cases notified early in the year. The appliance employed was a Higginson syringe with vulcanite nozzle, which had previously been used in many cases to give enemata, and was not disinfected or sterilised in the interval. This practice having been discouraged, douches have not been given in most of the later cases unless when ordered by a doctor. Vaginal syphon douches, or douche cans, and glass nozzles have then been used.

The clinical symptoms present early in the disease have been raised temperature and quickened pulse rate.

Raised temperature was present in every case. In 48 cases out of the total the initial rise took place within three days. Generally the rise was gradual, but occasionally it set in abruptly, and was marked. Increased pulse rate was not definitely noted in every case, but this is probably due in general to the inability of midwives in the past to take pulses accurately. It was definitely noted in 49 cases, and was occasionally present before the raised temperature. The increased rate usually took place before the third day.

The next most common sign was abnormal change in the lochia. Fœtor was the most marked change in the discharge, while it was noted to be profuse or scanty in an equal number of cases. In 22 cases the change occurred before the fourth day. In 11 cases, all notified about eight days after labour, no change had occurred; of the eleven cases, two died. In four only of the eleven cases was rigor present, but in all there was early raised temperature and quickened pulse rate.

Abdominal pain and tenderness was a frequent symptom; very severe after-pains were present in many of the cases.

Rigor was noted to be present and to be absent in an almost equal number of cases.

In the cases where rigor occurred early raised temperature was also present, and where it occurred late the temperature had been raised for some days.

Sleeplessness, delirium, sweating, headache were frequent symptoms, while in very few cases was there suppression of milk, secondary post-partum hæmorrhage, or pulmonary complications. Phlegmasia alba dolens only occurred in two of the cases notified.

Sources of infection in the puerperal fever cases notified have been traced in several instances to mild and unsuspected cases. The case infected from the mild one has in some instances proved fatal, death occurring at an early date after the onset.

Generally where such infection took place the midwife was carrying on her duties carelessly, her appliances were not disinfected, she carried out very perfunctory disinfection of the patient or of her own hands, and did not pay heed to the symptoms which arose.

All cases of puerperal fever are investigated. When a case of puerperal fever is notified, where a midwife has been in attendance, the Executive Officer makes a special investigation. In addition to the enquiry into the case itself it has been possible in some instances to investigate the midwife's mode of practice. Valuable information has thus been obtained, as cases of suspicious illness have been traced immediately preceding the confinement where notified puerperal fever occurred.

When the patient is removed to hospital the midwife is at once suspended from all work until the necessary measures of disinfection and personal cleansing have been carried out, but when she is nursed at home the midwife must decide either to attend only this particular case or to give it up and be suspended from work until similar precautions have been taken.

The majority of the cases so far have been removed to hospital. In those cases which have remained, arrangements have generally been made for a private nurse or relative to take charge.



Before the suspension of the midwife is removed it is first of all necessary that complete disinfection should be carried out. The procedure adopted is that her personal clothing and bedding are removed to the Corporation disinfecting station and disinfected.

The midwife is instructed to have two disinfectant baths, and to pay special attention to her hair, nostrils, and nails. The Executive Officer personally supervises the disinfection of the midwife's hands and arms. They are washed for five minutes in soap and water, then for five minutes in lysol solution, and finally, after the soap has been rinsed off, they are soaked in corrosive sublimate solution (1-1000) for ten minutes. The nails are scrubbed in the disinfecting solution.

The bag, including the handle, is disinfected with corrosive solution (1-1000) and the appliances are sterilised or disinfected by the Executive Officer.

Disinfection having been carried out, the midwife must satisfy the Executive Officer that she has a working knowledge of the rules of the Central Midwives' Board and that she can take the temperature and pulse. When she has done so, a report is presented to the Medical Officer of Health and the suspension is removed. Generally suspension lasts two or three days, but in some cases has been even shorter. The disinfection thus carried out has been thoroughly reliable; no after-infection has occurred.

The particulars in relation to midwives attending puerperal fever cases will be found in Table A.

The various reports are filed and indexed against the name of the midwife, and particulars of the cases are entered in a puerperal fever register.

A full report is made to the Midwives' Supervising Committee, and in case of failure to comply with the rules of the Central Midwives' Board the midwife is summoned to appear before the Committee. If a *prima facie* case of negligence is established the report is sent up to the Central Midwives' Board.\* If not, she is admonished by the Committee.

Notice is always sent to the Central Board, giving the period of and reason for suspension.

The early notification of puerperal fever cases and the early subsequent disinfection carried out prevents the midwife carrying infection to other cases. She is allowed to wait 24 hours after there has been raised temperature above 100·4° F. with quickened pulse rate, so that the symptoms are generally fairly well marked when the doctor sees the case. There has been much reluctance to notify the mild cases, though these undoubtedly act as sources of infection for severe and fatal types. Notification has been delayed in the hope that the case may not prove to be puerperal fever, as it is known the midwife will

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\* Two such cases were sent up during 1905 and the Midwives were censured by the Central Midwives Board.

be suspended from practice ; such suspension, however, only lasts 48 hours when no breach of the rules has been committed, and when all necessary precautions have been adopted.

#### STILLBIRTHS.

Notifications of stillbirth occurring in the practice of a midwife are required to be sent to the local authority as soon as possible.

The forms are filed and indexed under the name of the midwife, and the details are also entered in a register : 263 stillbirths were thus notified last year.

The district distribution of these is given in Table B.

In the following seven districts the stillbirth rate was highest. They are given in order, beginning with the highest : Central, Openshaw, Hulme, Bradford, Ardwick, St. George's, and Chorlton on-Medlock. Next year it will be possible to estimate fairly accurately the number of stillbirths which occur in the City, as an arrangement has been made to obtain returns of all stillbirths buried in the various cemeteries.

The number of stillbirths occurring in the individual practice of midwives varied greatly.

Twelve midwives had a stillbirth rate exceeding 30 per 1,000 of the births attended by them while four women attended over 100 cases without a single stillbirth occurring in their practice.

Almost all stillbirths reported were investigated during the last six months of the year, but systematic investigation had to be given up through lack of time. It is to be regretted that there is not time to systematically continue these investigations, as valuable information is obtained with regard to the mode of practice of the midwife in addition to the facts obtained regarding the stillbirth. Two cases of puerperal fever were thus detected at an early stage. Next year it will be possible to make use of this material. In the meanwhile it may be stated that in 42 per cent. of the cases notified the child was premature, while in only 9 cases was the child illegitimate.

#### DEATH OF MOTHER OR NEW-BORN CHILD.

Notifications of the death of the mother or new-born child occurring in the practice of a midwife before a registered medical practitioner can be obtained must also be notified. No death of a mother has occurred. 34 notifications of deaths of new born children have been received. These are filed and investigated in the same manner as the stillbirths. Inquests have been held by the City Coroner during 1905 into the cause of two deaths where the

midwife was alleged to have been guilty of neglect. In one instance a copy of the depositions of the witnesses was sent to the Central Midwives' Board, and the midwife was suspended by the Supervising Committee.

#### OFFENCES UNDER SECTION 1 (SUB-SECTION 1) AND SECTION 10.

Six cases have been reported where women have displayed notices calling themselves midwives though not registered. These women were requested to remove such notices at once. They did so, and no further action was taken. They were also warned not to call themselves midwives.

No action has been taken under Section 10. Midwives have been requested to notify their intention of practising where they have not done so.

#### REGISTERS AND FORMS, ETC., IN USE.

1. Register of midwives practising in the area.
2. „ as to mode of practice of each midwife.
3. „ as to sanitary condition of house of midwife.
4. „ of puerperal fever cases.
5. „ „ suspensions.
6. „ „ medical records received.
7. „ „ notifications of stillborn children.
8. „ „ notifications of death of new-born child.
9. „ „ notifications of death of mother.
10. Form of notification of stillbirth.
11. „ „ notification of death of new-born child.
12. „ „ notification of death of mother.
13. Classification form of medical records received from each midwife.
14. „ „ notification of stillbirths from each midwife.
15. Investigation form for stillbirths or death of new-born child.
16. „ „ as to mode of practice.
17. „ „ for puerperal fever cases.
18. Returns from cemeteries as to stillbirths interred.
19. Report form to Medical Officer of Health as to removal of suspensions.
20. Classification form of puerperal fever cases for each member of Committee.
21. "Instructions" to midwives.
22. Instructions in feeding within the first 10 days of life.

Manchester midwives are, on the whole, not a very illiterate class, only seven being unable to read and write. Many of them have willingly carried out the new regulations, and have made considerable sacrifices to equip themselves up to the required standard. The midwife who has been the most resourceful as



a barrier to progress has been the certificated woman. The bonâ-fide midwife has in many cases willingly taken advantage of the instruction given, and has not adopted an obstructive policy.

The instruction given to midwives has so far been individual, and generally two hours were given to each midwife at the first visit. It has thus been impossible to pay frequent inspection visits to each midwife in her own home. I am convinced, however, that at first only repeated individual practical instruction in all matters relating to the rules is of value. After that groundwork has been laid an attempt may be made to give instruction to midwives collectively; even then midwives should be chosen carefully, the number taken on each occasion should be small, and the tuition given should be essentially practical and tutorial.

The inspector's first visit to a midwife is well worthy of consideration. Much depends on the intelligent sympathetic outlook of the official whether the midwife will be a force for future help in the administration of the Act. The impossible must not be looked for. We cannot expect women who have had little training and less practice in thorough cleanliness and in the use of antiseptics to acquire at once the habit of surgical cleanliness which it takes intelligent men and women years to acquire when trained under the best conditions.

The work of the inspector should at first at least be largely educational.

After inspection visits have been paid to midwives in their homes actual oversight of the midwife while at work should be carried out. It is there possible to bring home to them the instruction which they received and to estimate the working capacity of the midwife.

It is also important that the inspector should be aware of the actual conditions under which the midwives have to work.

These visits bring home to the people the new requirements, and may ensure more careful preparation on the part of pregnant women for the expected labour. Midwives are often summoned hastily to a labour which is almost over. In many cases no adequate preparation has been made to provide the necessary clean garments, and the bed and woman herself are dirty. Poverty cannot always be given as the excuse for this condition. Ignorance and laziness are also most important factors.

Sheets of glazed brown paper carried in the midwife's bag would be invaluable in such cases. The midwife cannot reasonably be expected to provide this, as these are the cases where fees are small or absent. Packets containing several sheets of brown paper and a sufficient quantity of gangee tissue to last during the puerperium might be given to midwives who would guarantee to use them only in suitable cases.

In connection with the training schools for pupil midwives, facilities might be given from time to time for midwives to attend labour cases conducted by the teaching staff. At least one of the cases so attended should take place on the district in a very poor home.

Many midwives would doubtless gladly avail themselves of the opportunity if the fee was small, and the time required short. It would be invaluable in conjunction with the inspection work, and the necessity for and value of such instruction could be brought home by the inspector.

When instructing midwives it is important, after they have grasped the principles of cleanliness and antisepsis, to make sure they know how to use the appliances required. In every case the knowledge of the method of taking temperature and pulse should be practically tested. Raised temperature and increased pulse rate are the constant early symptoms of puerperal fever; therefore, midwives should be able to take both pulse and temperature accurately, and should be required to keep a record of these when taken.

Midwives are required to carry a separate appliance for giving vaginal and rectal injections. They should be required to use a separate appliance.

In Manchester a vaginal douche can or syphon douche with glass nozzle is insisted on, and the practice of daily routine douching of women after labour has been discouraged.

In inspection work it is a mistake to place too much reliance on register records. False entries or wilful omissions may with ease be made, and are often difficult to check. A check can be applied, however, and any organised effort at concealment of cases would be eventually detected. Falsification of registers should be made a penal offence.

The educational value of the disinfection carried out when a case of puerperal fever occurs is very great.

The progress of most of the midwives has been very encouraging. A higher standard of personal cleanliness has been maintained within the last six months; the registers have been well kept; and where formerly dirty and often inadequate appliances were carried there is now a well-equipped bag, which is kept in good order.

Many midwives have adopted the suggestion advised in the handbook of instructions to apply a wet pad wrung out of antiseptic to the vulva.

The mode of practice has on the whole been fairly careful. This may be inferred from the fact that there were 23 midwives attending each 100 labours and upwards, with an aggregate number of 3,688 labours, who had not a case of puerperal fever in their practice of which we had any information.



There were also seven midwives having each over 200 labours, with an aggregate number of 1,549 labours, who had not a single case. It is true cases may have been overlooked or concealed, but deaths could not, and certainly there was no death of a lying-in woman among those mentioned.

The diminution in the number of fatal puerperal fever cases occurring in the practice of midwives since the end of June, 1905, is also very satisfactory.

The work has grown steadily, and during the present year there is every prospect that such growth will continue. Midwives are important factors in the public life, and full advantage should be taken of their unique opportunities to instil into mothers the simple hygiene of the home and the value of care and proper dieting of the new-born child. Unceasing effort should therefore be made to continue extended instruction to midwives in the rules of the Central Board.

On behalf of the Special Committee,

A. W. CHAPMAN,

*Chairman.*

Town Hall, Manchester,

26th April, 1906.

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## WORK OF THE LADIES' PUBLIC HEALTH SOCIETY AND THE LADIES' SOCIETY FOR VISITING THE JEWISH POOR.

The table on page 261 shows what amount of work these Societies have done during the year 1905.

The work performed by these Societies for a number of years in teaching personal and household cleanliness in the poorer districts of the City has had a marked effect, and an improvement on former conditions can be discerned. The Medical Officer of Health desires to acknowledge the services rendered by the Lady Officers and District Lady Superintendents of the Societies in guiding and aiding the work of the Female Health Visitors.

From the above table it will be seen that the Health Visitors have made 14,424 inspections of houses during the year in the course of systematic house-to-house visitation in their respective districts. They have also made 1,746 special enquiries in cases of death, and have laid 777 complaints as to insanitary conditions which they have detected in the course of their daily work.



A summary of the work done by the Health Visitors under the supervision of the Ladies Public Health Society and of the Medical Officer of Health is given in the following table:—

Work of Female Health Visitors, Year ending 31st December, 1905.

(a) LADIES' PUBLIC HEALTH SOCIETY.

DISTRICT	Number of Cottages in District	HOUSES VISITED		CONDITION OF HOUSES						SICKNESS			Leaflets left at Houses	Disinfecting Powder left at Houses	LIMEWASHING							Reports as to Children (being Neglected (clothing, food, &c.)	Help Rendered  Help rendered includes :—Giving food, clothing, &c., advising mothers as to care and treatment of children, making of sick beds, cleaning houses for sick persons, obtaining recommends for Convalescents, &c.	Death Cards	Average Death-rate, 1900-1-2					
		First Visit	Not First	Dilapidated	Not Dilapidated	Clean	Dirty	Improved since last Visit	Not Improved	Overcrowded	No. of Houses containing Lodgers	Complaints requiring action by Sanitary Department			Infectious	Non-Infectious	Total Sickness	Living and Bed Rooms	Kitchens	Yards	Closets					Cellars	Coal-places	Ceilings	Staircases	
1. Ancoats, West .....	1434	...	560	24	536	512	48	371	189	6	66	46	...	128	128	540	91	35	60	59	12	...	75	9	...	...	31	115	32.5	
2. Ancoats, North .....	2137	...	1117	4	1113	1036	81	49	1068	1	206	14	4	187	191	494	44	27	52	53	16	1	68	10	...	7	163	135	29.1	
3. Ancoats, Central .....	1021	...	903	...	896	863	40	244	659	2	46	11	27	232	259	707	105	89	101	103	18	13	70	23	...	13	178	77	32.7	
4. Ancoats, South .....	1398	...	955	17	938	679	276	212	743	8	89	42	10	191	201	982	45	112	125	128	19	48	28	30	...	32	258	107	24.5	
5. Ancoats, East.....	1166	...	1256	89	1167	1067	189	296	960	6	312	80	33	231	264	1283	35	53	69	69	...	25	53	18	...	10	241	65	24.3	
6. London Road .....	1820	...	996	81	915	891	105	470	526	4	108	61	17	215	232	1420	203	96	241	233	43	28	124	16	...	9	221	90	27.7	
7. Deansgate .....	1705	...	796	10	786	650	146	208	588	7	219	41	10	271	281	851	84	73	85	95	22	57	37	33	...	...	139	100	34.6	
8. St. George's, North.....	3052	...	611	1	610	608	3	90	521	5	84	17	2	20	22	474	15	23	29	29	...	1	12	2	...	1	114	126	...	
9. St. George's, East.....	1421	...	747	17	730	736	11	112	635	...	51	29	6	47	53	747	4	25	18	20	4	...	2	...	...	...	24	114	126	...
10. St. George's, Central .....	1422	...	326	43	283	298	28	39	287	11	54	46	1	35	36	298	92	28	54	57	3	1	82	42	...	...	72	163	...	
11. Angel Meadow .....	1023	...	229	4	225	192	37	97	132	1	138	7	1	13	14	183	13	1	...	...	...	...	...	1	...	3	102	70	...	
12. Chorlton-upon-Medlock,North .....	1808	...	1102	4	1098	1031	71	313	789	1	136	16	4	148	152	1503	63	66	83	84	17	9	67	15	...	...	72	34	46.6	
13. Chorlton-upon-Medlock,South .....	893	151	757	2	906	898	10	163	594	1	146	83	6	120	126	1465	35	118	148	147	52	...	20	3	...	1	305	134	...	
14. Hulme, West .....	830	114	346	9	451	437	23	6	340	2	58	8	14	131	145	500	53	68	72	77	13	...	9	7	...	...	108	167	...	
15. Hulme, Central .....	3288	33	438	30	441	357	114	24	414	5	111	25	4	129	133	442	10	5	22	22	8	...	39	2	...	...	235	100	...	
16. Hulme, East .....	1134	203	432	2	633	616	19	172	260	1	106	4	1	94	95	381	45	26	30	27	...	...	12	...	...	2	97	120	...	
TOTAL .....	25552	501	11571	344	11728	10871	1201	2866	8705	61	1930	530	140	2192	2332	12270	937	845	1189	1203	233	183	698	211	...	109	2443	1746	...	

(b) LADIES' SOCIETY FOR VISITING THE JEWISH POOR.

17. Red Bank.....	657	10	1258	6	1262	1258	10	184	1070	...	295	81	1	145	146	1139	79	46	22	4	8	...	124	9	...	106	16.1
18. Strangeways .....	394	248	836	18	1066	1000	84	212	624	...	588	105	1	98	99	1145	...	5	13	14	10	...	2	...	...	42	...
TOTAL .....	1051	258	2094	24	2328	2258	94	396	1698	...	883	186	2	243	245	2284	80	51	35	18	18	...	126	9	...	148	...
GRAND TOTAL .....	26603	759	13665	368	14056	13129	1295	3262	10403	61	2813	716	142	2435	2577	14554	1017	896	1224	1221	251	183	824	220	109	2591	1746

They have distributed no fewer than 14,554 leaflets on the following matters :—

1. The Prevention of Diarrhœa.
2. The Prevention of Consumption.
3. Precautions against Measles.
4. Precautions against Whooping Cough.
5. Suggestions to Householders.
6. How Infants should be Fed, etc.

By the distribution of the leaflets and by personal instruction a system of educational work is constantly going on amongst the poor.

Disinfecting powder has been left at 12,104 houses.

The importance of cleanliness of the houses and person is steadily inculcated.

*Limewashing.*—The Visitors supply brushes on loan, and give the necessary sanitary dry lime to tenants of houses who will undertake cleansing. During the year they have been enabled to get 5,836 rooms, yards, closets, etc., thoroughly cleansed and limewashed. To this portion of their work the Medical Officer of Health attaches great importance.

In the course of their daily visits they came across 109 cases of neglected children. The parents were warned in many instances, and others were reported to the Society for the Prevention of Cruelty to Children.

Help was rendered to 2,591 families in many ways, such as in food and clothing, advising mothers as to the management of their children, making the beds of sick patients and cleaning their houses, obtaining recommends for Convalescent Homes, and in the summer months arranging to send children into the country for a holiday, and to the Manchester Camps at Birkdale and St. Annes for Poor Children at the Seaside.

During the year they have been engaged in another very important work, viz., supervising the disinfection of houses in cases of Consumption, and seeing to their subsequent cleansing, and, so far as I can judge, this work is carried out satisfactorily. At the end of the year they had 513 cases of Consumption under observation in their respective districts. It is their duty to report monthly as to whether the house is clean and free from dust and dirt, and every three months they see that a thorough cleansing of the house takes place, so as to keep down infective material as much as possible, viz.: the walls are rubbed down with dough, the floors and furniture washed, and the bed clothing and personal clothing of the patient washed in boiling water.



I attach, also, very great importance to the work which the Health Visitors are doing in the instruction of mothers in the procedures which they must adopt when artificially feeding their children.

They have received special practical training in the methods and precautions required in the preparation of foods and in the feeding of infants ; and I hope that, in this way, the assistance given to mothers unable to suckle their children has been rendered more valuable.

I have pleasure in stating that Miss Eleanor Greg has undertaken on behalf of the Ladies' Public Health Society to supervise the work of the Health Visitors for the Medical Officer of Health. It is understood that she is to act under the instructions and be responsible to the Medical Officer of Health. Miss Greg holds the certificate of the Sanitary Institute, and will, I believe, improve the efficiency of the work as far as that is possible under existing conditions.

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## MONSALL HOSPITAL.

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### MEDICAL SUPERINTENDENT'S REPORT FOR THE YEAR ENDING DECEMBER 31ST, 1905.

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I submit the usual tables showing in statistical form the work done during the year 1905. It is necessary, however, to point out that the number of cases treated is hardly sufficient to enable any inference as to the nature of the disease in question to be drawn with accuracy. In this respect, there are many factors which cannot be recorded statistically, but which influence the results to a greater or less extent.

The average number of patients treated daily shows a slight increase on that of last year, but the number of patients remaining in hospital at the close of the year is much greater.

The total mortality of all diseases is slightly higher. This is mainly due to the increased fatality from Diphtheria, this again being on account of the fact that cases are admitted late in the course of the disease without having been previously treated with antitoxic serum.

The most noticeable feature in the clinical work has been the increase in the number of cases of Puerperal Fever under treatment. This is probably due to the operation of the Midwives Act. In practice, as these patients are always seriously ill on their admission to hospital, and are often in a condition of extreme danger, their treatment involves more surgical and nursing labour than



is required in any other notifiable infectious disease. As a matter of fact, the amount of work performed by the medical and nursing staff of an isolation hospital does not, in practice, bear very much relation to the number of patients under treatment. The reason for this is that, in every such hospital, the staff is numerically insufficient for the ideal treatment and investigation of disease. In consequence, advantage has to be taken of any falling-off in numbers to work up arrears that have accumulated during the period of pressure. An isolation hospital in this country does not enjoy the possession of a staff of unpaid workers. In America they are more fortunate in this respect.

I think this point is hardly sufficiently, if at all, appreciated by the rate-paying public. They generally, in my experience, expect a fall in the number of patients to be followed by a corresponding diminution of the staff employed. In this respect, a hospital does not resemble an industrial factory.

During the year 1905, the number of patients that have benefited by the surgical treatment of disease has increased. In addition to minor work, there have been performed in the operating theatre 126 major operations. In conjunction with this, there has been a development of the precautions for securing asepsis in the surroundings of each patient, and thus bringing the treatment of infectious disease more into line with that adopted in the surgical wards of a general hospital. The advantages of this development have been apparent clinically, though it is not possible to make a statistical report on the subject.

In the past year, the disinfecting apparatus showed signs of wear, and was replaced by a new machine of the latest type. In this, the usual method of disinfection is by high pressure steam, though either current steam at low or high pressure, or hot air, can be employed.

A new mortuary has been erected which is now approaching completion, and the laboratory accommodation has been considerably enlarged by the utilisation of a building which formerly contained the disinfecting apparatus. The hospital laboratory is now an exceptionally good one.

In September, 1905, it was decided, chiefly on account of certain defects in the system of drainage which then became apparent, to discontinue the use of the wooden buildings. This diminished the scarlatinal accommodation of the hospital by 120 beds.

On the applications for the post of Probationer Nurse at this hospital, no less a number than 90 per cent. have been rejected as obviously unsuitable for training or as being illiterate. Of those engaged, 22 per cent. were found unsuitable for further training during the probationary period of three months, and were, in consequence, not engaged permanently, whilst during the same time

10 per cent. left on their own account, usually because they considered the work too hard for them : this, however, was due not to physical or mental inability so much as to an erroneous preconception on their part of the duties of a nurse.

During the year 1905, 34 certificates were granted at the conclusion of the two years fever training.

I much regret that nurses from this hospital who have received only two years training in the care of cases of infectious diseases continue to be employed subsequently in nursing homes, where there can be little doubt that they are regarded by the general public as fully-trained nurses. Until the qualification for a fully-trained nurse is defined by legislation, I fear that this practice will continue, though it is productive of many bad results.

Of the entire staff of the hospital, 8 contracted Scarlet Fever, 4 Enteric Fever, 5 Diphtheria. All recovered. There has been the usual proportion of minor ailments, but I regret to say that two of the staff, one nurse and one wardmaid, have died, in each case through non-infectious illness in no way connected with their duties here.

#### PUERPERAL FEVER.

During the year 1905 the number of cases of Puerperal Fever amounted to 41, and of these 31 were discharged cured and 10 died, showing a mortality of 24·4 per cent. The number of admissions has increased somewhat (16 cases were admitted during 1904), probably on account of the coming into force of the Midwives Act.

I propose to describe the procedure that is adopted in dealing with these cases, in so far as the results obtained thereby tend to throw any light on the causation of puerperal septic disease, or on the administration of the Midwives Act.

Before the admission of each patient, the certifying medical man is asked to give the details of the case on the annexed form ; this information would have been of much greater value to us had the individual forms been more fully filled in. In practice, however, and owing chiefly to the almost universal omission of dates, a further enquiry has had usually to be made after the admission of the patient. Every effort has been made to obtain as accurate information as possible, and in this respect I am greatly obliged to Dr. Merry Smith for the help she has given me. Information thus collected is carefully filed for future reference.

On the admission of the patient, after a brief preliminary examination in the ambulance van, which is devoted chiefly to an estimation of the severity of the disease and the elimination of any co-existent infectious disorder that would require the complete isolation of the patient, a further examination is



made in the operating theatre, the patient being under an anæsthetic, and having been previously prepared for any operative measure that may be found necessary. The first procedure has been to take swabs from the interior of the uterus for bacteriological examination, and in many cases a smear specimen from the swab has been stained and examined forthwith. In every case as complete a study of the organisms present as possible was subsequently made in the bacteriological laboratory of the hospital. Any operative measure that was seen to be necessary was then proceeded with. In all except five cases, curetting of the uterus was required, and for this purpose a sharp curette of somewhat larger size than those generally used for the non-puerperal uterus has been employed. This procedure has invariably been followed by a thorough disinfection of the resulting raw surface by the application of undiluted izal fluid. On the thoroughness of this disinfection the success of the operation, in my opinion, almost entirely depends. The object of the operation is not only to remove any retained products of conception, but to thoroughly disinfect the interior of the uterus.

The next step is to neutralise, if possible, the poisonous products of the infecting organisms, and for this purpose large doses of bactericidal sera have been employed. Of these sera, two types have been found most useful: one prepared from pure cultures of various streptococci that have been isolated from previous cases of Puerperal Fever; the other from pure cultures of the bacillus coli communis, which have also been obtained from puerperal cases only. During 1905, the antistreptococcic sera were employed in 26 of the completed cases, and the anticolon bacillus serum in 4 cases.

The difficulty with the latter has been that it has hitherto not been possible to determine the presence of the organism in the uterus of the patient in a shorter period than about four days, but a method has recently been introduced by which it can be detected within 12 hours, so I anticipate an increased field for this serum in future.

The sera used have been prepared by Dr. Dowson, of the Wellcome Research Laboratories, mainly from material taken from cases treated in this hospital, and I take this opportunity of thanking him for the help he has given me in this matter. In all cases a considerable dose was employed, ranging from 40 c.c. of either serum at the beginning of 1905 to 100 c.c. towards the end of the year. These sera have occasionally failed to do any obvious good, but in no case have any untoward symptoms occurred except transient rashes, such as are found to occur after the injection of antidiphtheritic and other sera.

In every case the patient has been detained in hospital until she was fit for ordinary house work, and free from pelvic pain on exertion.



The cures, then, may be regarded as presumably complete. On this account the stay in hospital of some cases has, therefore, been a long one. I do not give in this connection the "average stay" of the puerperal cases, as this is only an arithmetical expression, and has no clinical value whatever. Speaking of the cases generally, the most noticeable feature has been, in my opinion, their extreme severity. Every case was obviously dangerously ill, and many appeared to have but a few hours to live. In all there was evidence of deep septic intoxication. Some were completely comatose, almost all partially so, and about one-third in a condition of raving delirium.

It is obvious that these cases do not represent the usual results of puerperal infection, but they do show how intense this may be, and to what extent patients may suffer from the dirt, ignorance, and neglect which it is the purpose of the Midwives Act to diminish. Statistically, however, these cases are of no value, and it is difficult to see how a series of statistics which can be sufficiently extensive to be of any value clinically could be prepared. Still, it is evident that the milder cases of Puerperal Fever if notified are not admitted to hospital. This, I cannot help thinking, is a matter for regret, as it is doubtful whether patients can ever obtain such complete rest or such skilled nursing in their homes as in hospital, and it is upon these last two factors that the success in treatment must largely depend. Moreover, the present high price of these bactericidal sera must for some time militate against their employment in private practice. I should add that the mere severity of these cases has made them valuable from an educational point of view, as the classes of students have had an opportunity, which has not hitherto been possible, of seeing some of the results of puerperal infection.

Another point is that 23 cases, or 60 per cent., were not attended by medical men at all during the confinement, a midwife only having been present. It cannot be said, therefore, that the bulk of our cases (*i.e.*, the severe ones) were caused by want of antiseptic precautions on the part of the medical practitioner. In the cases that have been attended in the first instance by midwives only, the medical man usually notified, and asked for the removal of, the patient as soon as he was called in. There certainly appears to have been delay on the part of the midwife in sending for the practitioner in almost every case.

In the instances where the medical man has been present at the confinement, it is probable that he has caused infection by examinations or treatment at the actual time of delivery, as he would in the ordinary course of events only have occasion to make an external examination subsequently; but for the nursing of the patient during the puerperium the midwife or nurse only is immediately responsible, and during the whole of this period infection in every extent as intense as that implanted at the time of delivery is possible. Moreover, it is necessary to remember that even where a medical man is in attendance a

midwife or nurse is present also, and for every internal examination he would make the probability is that she would make five or six, so it is not possible to attribute all infection at the time of delivery to the practitioner merely because he was present. I mention this fact because in the medical press generally there is, to my mind, a tendency to cast undue blame on the medical profession in this respect.

Is it possible to distinguish clinically between infection at the time of delivery (presumably through dirty hands and instruments) and infection subsequently through dirty hands and surroundings? In the first place, it is exceedingly improbable that the incubation period either with streptococci or bacilli coli, which are the organisms more usually present, would be more than 48 hours, that is, judging by analogy from other forms of wound infection. In this series of cases there are 20 (or 57 per cent.) where this interval has been four days or longer. In the cases attended primarily by a medical man, the average interval elapsing between confinements and infection has been three days, and in no instance has it exceeded four days. In the midwives' cases, on the other hand, the average period is four days, and one of six or seven days has been by no means uncommon.

I do not propose here to draw any deductions from the bacteriology of the cases. The results do not as yet enable us to state definitely that the presence of a certain organism is proof of the occurrence of any particular method of infection, but work on these lines is proceeding, and the outlook in this respect is, I think, hopeful. In legislating for the prevention of puerperal fever, I am of opinion that undue stress has been laid on infection at the time of delivery, and the precautions to prevent later contact with dirty clothes and surroundings have hardly received a sufficient amount of attention. The interval elapsing between the onset of septic symptoms and the notification of the cases (for all were admitted as soon as they were notified) was in some instances very long, and its average was six days. From the clinical point of view this is much to be regretted, and it is, in fact, evident that many were notified only as a last resort, and it would appear that the presence of unmanageable delirium or the very obvious aspect of impending death was the ruling factor in this respect.

In nearly all the cases where the medical man was in attendance at the time of birth, instrumental interference had been resorted to, and in some of these it is evident that this had been accompanied by want of skill in the procedure, as evidenced by an extent of laceration of the parts that could not from its anatomical position have resulted from natural causes. It is a matter of common knowledge amongst gynæcologists that in many instances, especially in the poorer class of patient, instrumental interference is habitually resorted to, mainly to save the time of the practitioner.



It is important to recognise that, amongst other ill effects, an attack of puerperal septicæmia often results from this most selfish and reprehensible practice.

When one bears in mind, too, that amongst those attending the out-patient department for the diseases of women at our general and special hospitals, at least one-third owe their disease (which often, by-the-by, never leaves them) to septic infection at the time of, or shortly after delivery, it is evident that there is a great deal of preventive work to be done in this respect, and for this purpose I am of opinion that, speaking generally, it would be better if the mild as well as the severe cases were admitted to isolation hospitals for treatment. In this, as in some other infectious diseases, the benefit to the patient, as distinguished from the advantage to the community, to be gained from her removal to hospital seems hardly to have received adequate recognition from the medical profession and the general public.

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### SCARLET FEVER.

The number of scarlatinal admissions does not differ materially from that for 1904, while the mortality continues low, being 3·6 per cent., as against 3·3 per cent. for 1904. There has been no apparent change in the type of case admitted, nor in the period in the course of the disease at which they have been received. Roughly speaking, cases of scarlet fever are admitted as a rule before the fourth day of the disease, the third day (that is to say, the second of the eruption) being the most common.

The most interesting point in the record of complications is the marked lowering of the incidence of rhinitis, there having been a diminution of 18 per cent. There can be little doubt that this is due to a change in the routine method employed for the irrigation of the throat and nose that was made at the beginning of the year.

Formerly a mild alkaline antiseptic solution was employed for this purpose, which was introduced from a douche at a height of two-and-a-half feet above the level of the patient's nostrils; the change consisted in the lowering of the douche to a height of one foot and the substitution of plain tap water for the antiseptic solution.

Another interesting point is that the incidence of otorrhœa was lower by 6 per cent., but it is noteworthy that the reduction was not nearly so great as in the case of rhinitis.

Much attention has been directed during 1905 to the treatment of the numerous conditions which give rise to a discharge from the ear in Scarlet Fever, and it may be as well to outline briefly what is the usual procedure at Monsall Hospital in this respect.



As soon as a patient develops a discharge from either ear a bacteriological examination of the secretion is made. When, as is sometimes the case, bacilli resembling morphologically those of Diphtheria are present, the ear is irrigated with antiseptic and astringent lotions, and a small dose of antitoxin is administered. Whether these organisms are present or not, a discharge from the ear is recognised as being infectious to other patients, and until it has ceased the affected ear is kept covered and bandaged, so that contamination of the linen and clothing is prevented.

During the course of the otorrhœa the patient is examined frequently in a special room, which is well provided with the necessary appliances, and any minor operative treatment is there undertaken. Enlarged tonsils and adenoid vegetations are removed if this has not previously been done.

If after from a month to two months' treatment in this way no improvement results, or if at any time signs suggesting the presence of necrosis of any part of the temporal bone present themselves, the mastoid antrum is explored, and if necessary the radical operation with removal of the ossicles resorted to. During the year 1905 the mastoid process was cleared of carious bone in 19 cases, and the radical operation performed in 43. In these latter, marked improvement of hearing resulted in all but two instances.

Bearing in mind that a patient who suffers from a discharge from the ear is not only thereby disqualified from admission to the public services, or from the benefits to be obtained from life assurance (for no insurance company will accept him as a policy holder), but also runs an appreciable risk of death from extension of the mischief to the interior of the skull, I am of opinion that no patient should under ordinary circumstances be discharged from a fever hospital with a chronic ear discharge. The function of an isolation hospital is not merely to remove the patients from contact with the community, but to free them from the consequences of the disease from which they were admitted, if this be possible. The bulk of the relatives of our patients are unable to pay for adequate treatment of the ears in their own homes, and they do not, moreover, take the children to the ear hospitals when they are advised to do so. As they cannot see the danger with their own eyes, they do not, as a rule, believe in its existence.

The incidence of post Scarlatinal Diphtheria continues to be very low, only 13 patients, or 0·9 per cent., having contracted this disease. I am inclined to attribute this to the frequency with which bacteriological examinations are made and to the stringency of the antiseptic precautions that are adopted in the treatment of the throats of the scarlatinal patients.

At Monsall, rubber gloves are always worn by the nurses when they are engaged in this part of their work.

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## ENTERIC FEVER.

The number of patients under treatment has been substantially the same as last year, and the mortality is 1 per cent. higher.

Clinically, no change worthy of note has taken place in the nature of this disease or in its treatment. At this hospital it is the custom to vary the diet considerably in cases of Enteric Fever, carefully prepared solid food being given during the acute stage whenever possible. There can be no doubt that the general results have been much better since this method was adopted, there having been a marked lowering in the incidence of perforation of the intestine, hæmorrhage, and of relapse of the disease. These are, incidentally, the disasters which were supposed to have been avoided by confining the patient to a diet of milk only for a prolonged period. The period of convalescence is also much shorter than formerly. It is also becoming more clearly recognised that in many cases Diarrhœa is not a natural consequence of the disease itself, but is often due to the inability of the patient to digest milk. As a matter of fact, almost all our patients are admitted with clear signs of this inability.

It is unfortunate from the clinical point of view that so many of our cases are admitted late in the course of the illness. Of all cases 65 per cent., and of the deaths 66 per cent., were admitted after the tenth day of illness. That this is not entirely due to the failure of the relatives to seek medical advice is shown by the fact that a quarter of all cases, and rather less than a third of those that died, had been under the observation of a medical man for more than ten days before admission. On the other hand, there is a great improvement on last year in that 25 patients, as against two only in 1904, were sent in by the doctor as soon as he saw the patient. Fewer obviously moribund cases were admitted also this year.

It should also be remembered that scarcely any of our patients have received adequate nursing before their admission.

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## OTHER DISEASES.

These include cases in which the diagnosis of the certifying practitioner was not confirmed after more or less prolonged observation in hospital. In this connection it is necessary to point out that the practitioner often has to give an opinion on a case where anything like adequate examination is impossible, and that we in hospital have, as a rule, observed the patient carefully for two or three weeks. Moreover, our diagnosis has often been made only after repeated bacteriological examination. In many cases it is in the best interests of the patient and of the community that he should be sent in forthwith, whether the diagnosis be correct or not



I may say that no patient is admitted to a scarlet fever ward unless it is possible to say at the time that he has positive signs of that disease. Otherwise he is sent to an isolation ward. In the cases where an original diagnosis of Diphtheria is doubtful he is given a prophylactic injection of antitoxic serum.

In the case of Scarlet Fever it is interesting to note that the commonest mistake lay in confusing it with a slight sore throat of no special significance, or with a fleeting rash, rather than with other infectious disorders.

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### ERYSIPELAS.

As a matter of fact, not more than one-half of our cases were suffering from true Erysipelas, the remainder having been cases of cellulitis and of general septicæmia from wound infection. From true Erysipelas, where the local manifestation was confined to the skin, only 3 died.

This, however, is the fault of the definition. The more severe cases of wound infection and cellulitis are more infectious to other wounds than true Erysipelas, and are more in need of hospital treatment, which they cannot obtain in a general institution. They are, in my opinion, quite rightly notified as "Erysipelas," the difference being only one of site, and not of the infecting organism.

For the sections of the report on Diphtheria and the Laboratory I am indebted to Dr. M. B. Arnold, Senior Assistant Medical Officer.

A. KNYVETT GORDON,  
*Medical Superintendent.*

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### MONSALL HOSPITAL LABORATORY.

In November, 1905, a new laboratory was opened, and so equipped that more extensive work could be carried on by the hospital staff. The arrangements for the preparation in the laboratory of media for the growth of bacteria effected a great economy, and permitted an increase in the scope of research.

Many investigations in which time is of great importance to the welfare of the patient, and which were previously impossible, are now performed as a routine practice. As an instance one may cite the demonstration in twelve hours of the presence of a bacillus of the bacillus coli group in a specimen from a patient, leading to the prompt administration of a suitable serum.

The work of the laboratory touches on most of the diseases admitted to the hospital, but, of course, the most important is the examination of specimens for the presence or absence of the bacillus of Diphtheria. This examination is carried out in a large number of scarlatinal cases as well as in those admitted as Diphtheria, and is repeated before the discharge of the patients



The books of the laboratory show that in 1905 reports on 7,611 such specimens were returned, of which 750 showed the presence of a bacillus suspiciously like the Diphtheria bacillus. It should be explained that where the problem of dealing with suspicious cases is confined to those already in hospital, it is sufficient to demonstrate the presence of a bacillus morphologically suggestive of Diphtheria to enable effective action to be taken.

In cases of Puerperal Fever the investigation includes the bacteriological examination of swabs from the uterus and of not less than 10 c.c. of the blood. When streptococci are found they are differentiated according to the methods of Klein and Mervyn Gordon.

The laboratory routine, by which specimens of tissues collected at practically all post-mortem examinations are submitted to microscopical investigation, is rapidly giving us a collection of preparations of considerable scientific value.

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### DIPHTHERIA.

The number of cases admitted was 306, as compared with 251 in the previous year. The number of cases requiring tracheotomy was especially greater, being 44 as against 25. The disease was frequently of a severe type, and the mortality is higher by over 3 per cent., being 19.9.

It is, of course, desirable to find the cause of this higher mortality by an analysis of the figures, but in this instance no such method gives a sufficient reason. On the whole, the cases were admitted rather earlier in the disease, though a great improvement remains to be made in this respect. The factor of greatest influence shown in the tables is the number of laryngeal cases and a particularly high mortality in those in which tracheotomy was performed. This last figure includes an unusual number of cases dying within 48 hours of admission. Of 23 deaths occurring after the operation, 11 were within 48 hours of admission. Bearing in mind these figures, and the clinical experience of the year, it seems probable that there has been an increased severity in the disease itself.

It is at such times that the slow spread of the knowledge of the powerful agent that antitoxin may be in saving life is most regrettable. The dangerous laryngeal form shows this very forcibly.

Many cases of faucial Diphtheria come to this hospital early in the disease. Many, owing to the ignorance or carelessness of the guardians, are in that stage still without medical attention, in this instance almost synonymous with serum treatment. In a number of such early cases the disease spreads to the larynx with terrible results. But throughout the year there has not been any case where a patient admitted to the hospital without laryngeal symptoms developed

any such trouble later. This can apparently only be attributed to the antitoxin, which when given early is shown almost certainly to ward off the very form of the disease in which the figures of this year show such a striking mortality.

Assuming for the moment that, apart from the virulence of the present type of the disease, the cause of the high mortality is delay in the administration of antitoxin, and as the delay certainly does not occur in hospital, the conclusion is obvious that it is the reception of cases late in the disease that is the indirect cause of the high mortality. Now in 181 cases out of 326 the medical man sent the patient to hospital on the first day that he was called in, so that it seems probable that it is in delay on the part of the parents or guardians in calling in medical aid that the cause is to be sought. If this is so, those cases in which a short history of disease is given should show a lower mortality than those in which several days have elapsed before a medical consultation. It seems probable that any mistake is likely to be on the side of minimising the length of the illness, so that any error from this cause would tend to mask the expected difference.

A table classifying the cases according to the number of days which the patient had been ill before a doctor was called in is appended, and gives the following results :—

There were 153 cases in which the doctor was called in on the first day, and in these the mortality was 11·2 per cent.

There were 173 cases in which the doctor was called in later than the first day, and in these the mortality was 24·8 per cent.

It seems probable that Diphtheria would remain longer unobserved by the parents in young children. Taking, therefore, the figures only for patients of six years and upwards as being more nearly accurate, the difference is more striking. There were 74 such cases in which the doctor was called in on the first day, and in these the mortality is 2·7 per cent. There were 88 cases over six years in which the doctor was called in after the first day, and in these the mortality was 20·4 per cent.

In all the cases admitted at all ages there were only 26 which were seen later than the fifth day, so that these figures deal almost entirely with the early days of the disease, and bear out the importance of the administration of antitoxin during that time. The numbers are not large, but the contrast is so great that one may with great probability attribute the high mortality to want of knowledge or of observation on the part of the parents or guardians. The reason for this condition of affairs is difficult to determine. Any expectation that infants would differ in this respect from school ages is not borne out by the figures. In the years 0—3, 37 were seen on the first day and 32 later. In the years 3—6, 42 were seen on the first day and 53 later.



In the years 6—9, 32 were seen on the first day and 39 later ; and from 9 years upwards, 42 were seen on the first day and 49 later. Thus the ratio in the age groups so taken does not differ much.

A question of considerable interest, both clinically and economically, is that of the administration of antitoxin late in the disease. A case of Diphtheria after, say, the seventh day has certainly had the tissues of the body exposed to a quantity of toxin long enough for the degenerative changes to be irrevocably begun. In the ordinary type of case the local lesion in the pharynx is probably no longer producing toxins. Under these circumstances a comparatively small dose of antitoxin is sufficient to neutralise any toxin that may be still free, and there is little evidence to show that antitoxin can heal the degenerating tissues, indeed, there is evidence that it does not do so. Accepting this view, quite small doses have been given during this year to later cases without obviously spreading membrane. The results have been satisfactory, no increasing number of complications having been observed in this type of case.

The rashes following antitoxin have not decreased in number, but appear to be milder.

M. B. ARNOLD, M.D., D.P.H.

STATISTICAL REPORT FOR THE YEAR 1905.

Remaining in Hospital January 1st, 1905.....	424
Patients admitted during 1905 .....	2164
	<u>2588</u>

*Discharged.*

Cured and Died.....	2301
Remaining in Hospital December 31st, 1905 .....	287
	<u>2588</u>

Total number of Deaths during 1905 .....	181
Net Mortality .....	8·4%

Of the deaths, 25 occurred within 48 hours of admission.

*Daily Averages.*

Patients.....	326·2
Nurses and Servants .....	165·4
Officers.....	5·9
Average stay of Patients (in days) .....	51·7



TABLE SHOWING MONTHLY DISTRIBUTION OF PRINCIPAL DISEASES  
THROUGHOUT THE YEAR.

1905	Scarlatina	Diphtheria	Enteric Fever	Erysipelas	Other Diseases	Total	Daily Average Number of Patients in Hospital
January .....	99	32	21	4	8	164	372·2
February.....	89	34	19	7	12	161	362·0
March .....	107	38	15	8	11	179	346·3
April .....	105	29	19	2	19	174	342·6
May .....	117	15	20	10	17	179	323·1
June .....	121	11	12	9	18	171	310·0
July .....	96	16	3	4	15	134	276·7
August .....	138	24	8	11	19	200	286·1
September...	118	30	20	5	14	187	301·1
October .....	169	28	32	9	16	254	335·6
November...	129	30	19	8	17	203	359·4
December. .	108	14	17	7	12	158	298·8
Total .....	1396	301	205	84	178	2164	326·2

CASE MORTALITY FOR 1893-1905.

Year 1893 .....	9·36	Year 1900 .....	6·22
„ 1894 .....	7·82	„ 1901 .....	7·15
„ 1895 .....	9·73	„ 1902 .....	8·80
„ 1896 .....	10·60	„ 1903 .....	8·50
„ 1897 .....	8·60	„ 1904 .....	6·50
„ 1898 .....	10·70	„ 1905 .....	8·40
„ 1899 .....	7·11		

YEAR	DISEASE	MORTALITY PER CENT.	YEAR	DISEASE	MORTALITY PER CENT.
1890	Scarlatina	12·2	1890	Enteric fever	16·4
1891	Do.	6·9	1891	Do.	19·1
1892	Do.	9·1	1892	Do.	19·1
1893	Do.	6·9	1893	Do.	18·6
1894	Do.	4·4	1894	Do.	15·9
1895	Do.	7·1	1895	Do.	20·1
1896	Do.	8·5	1896	Do.	19·6
1897	Do.	6·1	1897	Do.	13·3
1898	Do.	6·7	1898	Do.	16·1
1899	Do.	3·6	1899	Do.	12·3
1900	Do.	4·6	1900	Do.	11·8
1901	Do.	4·7	1901	Do.	13·9
1902	Do.	6·1	1902	Do.	10·9
1903	Do.	4·7	1903	Do.	19·2
1904	Do.	3·3	1904	Do.	14·1
1905	Do.	3·6	1905	Do.	15·1

TABLE SHOWING NUMBERS OF VARIOUS DISEASES TREATED.

DISEASE	Remaining in Hospital, Jan. 1st, 1905	Admitted during 1905	Dismissed, Cured, and Died During 1905	Remaining in Hospital, Dec. 31st, 1905
Scarlatina .....	319	*1396	1499	216
Diphtheria .....	54	301	326	29
Enteric Fever.....	26	205	206	25
Erysipelas .....	7	84	88	3
Puerperal Fever.....	0	41	35	6
Morbili .....	0	5	5	0
Other Diseases .....	18	132	142	8
Total...	424	2164	2301	287

\* Of these, 17 had Scarlet Fever and Diphtheria co-existent; 2 had Scarlet Fever and Mobilli co-existent.

SCARLATINA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad- mitted	Died	Mor- tality percent.	Ad- mitted	Died	Mor- tality per cent	Ad- mitted	Died	Mor- tality percent.
Under one year...	1	1	5.5	3	...	...	4	...	...
1 to 2 years...	18	5	11.1	13	2	15.4	31	3	9.7
2 to 3 „ ...	45	4	7.3	46	3	6.5	91	8	8.8
3 to 4 „ ...	55	1	1.5	53	4	7.5	108	8	7.4
4 to 5 „ ...	67	10	3.0	57	2	3.5	124	3	2.4
5 to 10 „ ...	332	3	2.7	317	13	4.1	649	23	3.5
10 to 15 „ ...	110	1	2.3	139	1	0.7	249	4	1.6
15 to 20 „ ...	43	...	...	44	...	...	87	1	1.1
20 to 25 „ ...	14	...	...	15	...	...	29	...	...
25 to 30 „ ...	4	...	...	12	...	...	16	...	...
Over 30 „ ...	4	...	...	6	...	...	10	...	...
Total .....	693	25	3.6	703	25	3.5	1396	50	3.6

Four deaths occurred within 48 hours of admission.

Average stay in Hospital .....year 1901...55.8 days.  
Do. do. ....year 1902...57.3 days.  
Do. do. ....year 1903...53.8 days.  
Do. do. ....year 1904...55.4 days.  
Do. do. ....year 1905...63.3 days.

Average stay in Convalescent Ward...year 1902...22·8 days.  
Do. do. ....year 1903...23·0 days.  
Do. do. ....year 1904...24·6 days.  
Do. do. ....year 1905...24·2 days.  
Do. Acute Ward..... ..year 1902...34·5 days.  
Do. do. ....year 1903...30·8 days.  
Do. do. ....year 1904...30·8 days.  
Do. do. ....year 1905...39·1 days.

YEAR	No. of Scarletinal Fever Discharges	No. of Cases of Post Scarletinal Diphtheria	Percentage	Died
1901 .....	2669	104	3·8	3
1902 .....	2018	29	1·4	1
1903 .....	1877	8	0·4	2
1904 .....	1560	7	0·4	0
1905 .....	1499	13	0·9	0

PERCENTAGE COMPLICATIONS IN SCARLET FEVER, 1905.

Complication	No.	Percentage
Otorrhœa .....	340	22·7
Rhinorrhœa .....	104	6·9
Nephritis .....	31	2·1
Albuminuria .....	16	1·1
Endocarditis .....	34	2·3
Adenitis .....	19	1·3

All patients with diphtheria, and all those suffering from scarlet fever who had at any time a discharge from the nose or ears, were examined for diphtheria bacilli before being discharged from the hospital.



ENTERIC FEVER.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality per cent
Under one year...	2	...	...	...	...	...	2	...	...
1 to 2 years...	4	...	...	...	...	..	4	...	...
2 to 3 „ ...	2	...	...	...	...	...	2	...	...
3 to 4 „ ...	1	...	...	6	1	16·6	7	1	14·4
4 to 5 „ ...	3	...	...	1	...	...	4	...	...
5 to 10 „ ...	8	...	...	10	2	20·0	18	2	11·1
10 to 15 „ ..	13	...	...	13	...	...	26	...	...
15 to 20 „ ...	17	4	23·5	15	3	20·0	32	7	21·8
20 to 25 „ ...	13	2	15·4	9	1	11·1	22	3	13·6
25 to 30 „ ...	26	5	19·2	13	3	23·1	39	8	20·5
30 to 35 „ ...	9	2	22·2	10	2	20·0	19	4	21·0
35 to 40 „ ...	9	3	33·3	2	...	...	11	3	27·3
40 to 45 „ ...	3	2	66·6	3	...	...	6	2	33·3
45 to 50 „ ...	3	1	33·3	5	...	...	8	1	12·5
Over 50 „ ...	2	...	...	3	...	...	5	...	...
Total...	115	19	16·5	90	12	13·3	205	31	15·1

Two deaths occurred within 48 hours of admission.

ENTERIC FEVER.

Average stay, in days, in Hospital .....	year 1901...	40·8 days
Do. do. ....	year 1902...	47·8 days
Do. do. ...	year 1903...	40·5 days
Do. do. ....	year 1904...	41·1 days
Do. do. ....	year 1905...	41·5 days.

PERCENTAGE COMPLICATIONS IN ENTERIC FEVER.

Complication	No.	Percentage	Complication	No.	Percentage
Bronchitis .....	3	1·4	{ Intestinal Hæmorrhage }	4	1·9
Pneumonia ...	5	2·4	Perforation ...	6	2·9
Relapse .....	4	1·9	Neuritis .....	1	0·5

TABLE SHOWING DAY OF DISEASE ON ADMISSION (ALL CASES).

Day of Disease on Admission	No.
1st Day .....	1
2nd „ .....	1
3rd „ .....	3
4th „ .....	3
5th „ .....	7
6th „ .....	4
7th „ .....	17
8th „ .....	11
9th „ .....	16
10th „ .....	14
Over 10 Days .....	129
Total .....	206

ENTERIC FEVER.

TABLE SHOWING DAY OF DISEASE ON ADMISSION (DEATHS ONLY)

Day of Disease on Admission	No.
1st Day .....	...
2nd „ .....	...
3rd „ .....	1
4th „ .....	1
5th „ .....	...
6th „ .....	1
7th „ .....	1
8th „ .....	1
9th „ .....	4
10th „ .....	1
Over 10 days.....	21
Total .....	31

TABLE SHOWING INTERVAL ELAPSING BETWEEN DATE WHEN PATIENT WAS FIRST SEEN BY A MEDICAL MAN AND THE DATE OF ADMISSION TO HOSPITAL.

	All Cases.	Deaths.
Sent in on same day .....	25	3
2nd day .....	8	2
3rd    " .....	19	1
4th    " .....	14	1
5th    " .....	30	7
6th    " .....	14	3
7th    " .....	13	1
8th    " .....	6	1
9th    " .....	11	2
10th   " .....	13	1
Over 10 days .....	53	9
Total .....	206	31

DIPHTHERIA.

TABLE SHOWING INTERVAL ELAPSING BETWEEN DATE WHEN PATIENT WAS FIRST SEEN BY A MEDICAL MAN AND THE DATE OF ADMISSION TO HOSPITAL.

	All Cases	Deaths
Sent in on same day .....	181	32
2nd day.....	41	9
3rd    " .....	41	7
4th    " .....	26	7
5th    " .....	10	1
6th    " .....	6	1
7th    " .....	9	1
8th    " .....	2	1
9th    " .....	3	...
10th   " .....	2	...
Over 10 days .....	5	1
Total .....	326	60



TABLE SHOWING DAY OF DISEASE ON ADMISSION (ALL CASES).

Day of Disease on Admission	No.
1st Day .....	41
2nd „ .....	49
3rd „ .....	61
4th „ .....	44
5th „ .....	45
6th „ .....	19
7th „ .....	24
8th „ .....	9
9th „ .....	7
10th „ .....	6
Over 10 Days .....	21
Total .....	326

TABLE SHOWING DAY OF DISEASE ON ADMISSION (DEATHS ONLY).

Day of Disease on Admission	No.
1st Day .....	1
2nd „ .....	9
3rd „ .....	13
4th „ .....	12
5th „ .....	12
6th „ .....	3
7th „ .....	2
8th „ .....	1
9th „ .....	2
10th „ .....	...
Over 10 Days .....	5
Total .....	60

DIPHTHERIA.

DAYS ILL before Doctor called in.	Ages under 3			Ages 3 to 6			Ages 6 to 9			Ages 9 and upwards		
	Cases	Deaths	Mortality	Cases	Deaths	Mortality	Cases	Deaths	Mortality	Cases	Deaths	Mortality
1 .....	37	7	18·9	*42	8	19·0	32	1	3·1	42	1	2·4
2 .....	12	5	41·6	17	3	17·6	21	6	28·5	15	3	20·0
3 .....	8	6	75·0	6	1	16·6	4	1	25·0	14	0	...
4 .....	5	1	20·0	12	1	8·3	7	2	28·5	10	1	10·0
5 .....	2	0	...	10	1	10·0	1	1	100·0	3	1	33·3
6 and upwards ...	5	4	80·0	8	3	37·5	6	2	33·3	7	1	14·3
	32	16	50·0	53	9	16·9	39	12	30·7	49	6	12·2

\*In 8 cases Tracheotomy was performed, 4 of which died (Mortality of Tracheotomy cases in this section=50%).

TABLE 1.—DIPHTHERIA.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality percent.	Ad-mitted	Died	Mor-tality percent.
Under 1 year ...	5	3	60·0	4	...	...	9	3	33·3
1 to 2 years ...	12	5	41·7	10	4	40·0	22	9	40·9
2 „ 3 „ ...	14	5	35·7	18	6	33·3	32	11	34·4
3 „ 4 „ ...	11	4	36·4	16	6	37·5	27	10	37·0
4 „ 5 „ ...	18	3	16·7	21	...	...	39	3	7·7
5 „ 10 „ ...	62	13	20·9	57	6	10·5	119	19	16·0
10 „ 15 „ ...	19	1	5·3	16	2	12·5	35	3	8·6
15 „ 20 „ ...	4	1	25·0	5	1	20·0	9	2	22·2
20 „ 25 „ ...	2	...	...	6	...	...	8	...	...
25 „ 30 „ ...	4	...	...	2	...	...	6	...	...
Over 30 „ ...	0	...	...	5	...	...	5	...	...
Total .....	151	35	23·2	150	25	16·7	301	60	19·9

Sixteen deaths occurred within 48 hours of admission.

TABLE 2.—TRACHEOTOMY CASES.

AGE OF PATIENTS	NO. OF PATIENTS	DIED	MORTALITY PER CENT.
Under 1 year .....	3	2	66·6
1 to 2 years .....	12	7	58·3
2 „ 3 „ .....	8	5	62·5
3 „ 4 „ .....	6	5	83·3
4 „ 5 „ .....	3	...	...
5 „ 10 „ .....	11	4	36·3
10 „ 15 „ .....	1	...	...
15 „ 20 „ .....	...	...	...
Total .....	44	23	52·3

Of these, 11 died within 48 hours of admission.

DIPHTHERIA.

Average stay in Hospital, in days, year 1901, 31·8		
Do.	do.	„ 1902, 50·7
Do.	do.	„ 1903, 34·1
Do.	do.	„ 1904, 37·3
Do.	do.	„ 1905, 41·6



TABLE 3.—COMPLICATIONS OF DIPHTHERIA.

Complication	Number of Cases	Percentage
Otorrhœa .....	13	3·9
Rhinorrhœa .....	4	1·2
All forms of Paralysis .....	49	15·0
Cardiac Paralysis alone .....	13	3·9
Ocular Muscles alone .....	...	...
Pharynx alone .....	...	...
Palate alone.....	27	8·2
Diaphragm alone.....	6	1·8
Laryngeal alone .....	3	0·9
Hæmorrhage Diphtheria .....	4	1·2
Adenitis of Convalescence .....	3	0·9

DIPHTHERIA BACILLI \*

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad- mitted	Died	Mor- tality percent.	Ad- mitted	Died	Mor- tality percent.	Ad- mitted	Died	Mor- tality percent.
Under 1 year.....	...	...	...	...	...	...	...	...	...
1 to 2 years ...	...	...	...	...	...	...	...	...	...
2 to 3 „ ...	...	...	...	...	...	...	...	...	...
3 to 4 „ ...	...	...	...	...	...	...	...	...	...
4 to 5 „ ...	...	...	...	...	...	...	...	...	...
5 to 10 „ ...	3	...	...	...	...	...	3	...	...
10 to 15 „ ...	2	...	...	1	...	...	3	...	...
15 to 20 „ ...	...	...	...	...	...	...	...	...	...
20 to 25 „ ...	...	...	...	...	...	...	...	...	...
25 to 30 „ ...	...	...	...	1	...	...	1	...	...
Over 30 years.....	...	...	...	...	...	...	...	...	...
Total.....	5	...	...	2	...	...	7	...	...

\* This table shows cases that were suffering from a nasal discharge containing diphtheria bacilli, but which had no signs of diphtheria clinically.

DIPHTHERIA.

	Ages under 3			Ages 3 to 6			Ages 6 to 9			Ages 9 and upwards			All ages		
	Cases	Deaths	Mortality per cent	Cases	Deaths	Mortality per cent	Cases	Deaths	Mortality per cent	Cases	Deaths	Mortality per cent	Cases	Deaths	Mortality per cent
Doctor called in <i>on</i> the first day ....	37	7	18·9	42	8	19·0	32	1	3·1	42	1	2·4	153	17	11·1
Doctor called in <i>after</i> the first day .	32	16	50·0	53	9	16·9	39	12	30·7	49	6	12·2	173	43	24·8

\* 4 of the deaths which come in this group occurred in severe laryngeal cases where Tracheotomy was performed.

ERYSIPELAS.

AGE OF PATIENTS	MALE			FEMALE			TOTAL		
	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.	Ad-mitted	Died	Mor-tality per cent.
Under 5 years ...	6	...	...	1	...	...	7	...	...
5 to 10 „ ...	...	...	...	1	...	...	1	...	...
10 to 15 „ ...	2	...	...	3	...	...	5	...	...
15 to 20 „ ...	6	...	...	1	...	...	7	...	...
20 to 25 „ ...	...	...	...	2	...	...	2	...	...
25 to 30 „ ...	5	...	...	2	1	50'0	7	1	...
30 to 35 „ ...	4	...	...	4	...	...	8	...	...
35 to 40 „ ...	6	1	16'6	2	...	...	8	1	...
40 to 45 „ ...	3	1	33'3	6	...	...	9	1	...
45 to 50 „ ...	3	3	100'0	5	...	...	8	3	...
Over 50 „ ...	12	2	16'6	10	2	20'0	22	4	...
Total...	47	7	14'9	37	3	8'1	84	10	11'9

OTHER DISEASES.

Certified as	Actual Disease	No.	Certified as	Actual Disease	No.
Scarlatina.....	Dermatitis .....	2	Diphtheria ...	No obvious	1
„ .....	Otorrhœa .....	1		Disease .....	
„ .....	T u b e r c u l a r	1	„ ...	Pneumonia ...	1
	Meningitis		„ ...	Rhinitis .....	1
„ .....	Diphtheria.....	4	Enteric Fever..	No obvious	2
„ .....	T o n s i l l a r	1		disease .....	
	Abscess .....		„ ...	Meningitis .....	3
„ .....	Pharyngitis ...	1	„ ...	Morbus Cordis	1
„ .....	N o o b v i o u s	12	„ ...	Appendicitis ...	2
	disease .....		„ ...	Bronchitis .....	1
„ . ...	Tonsillitis .....	18	„ ...	Enteritis .....	1
„ .....	Erythema .....	16	„ ...	Pneumonia ...	7
„ .....	Herpes .....	1	„ ...	U l c e r a t i v e	1
„ .....	Rhinitis .....	1		Endocarditis	
„ .....	Erysipelas .....	2	„ ..	Scarlatina .....	1
„ .....	Pneumonia ...	2	„ ...	Phthisis .....	1
„ .....	Rötheln .....	3	„ ...	Pulmonary Tu-	1
Diphtheria ...	L a r y n g e a l	1		berculosis	
	Spasm .....		Erysipelas ...	Bursitis of left	1
„ .....	Tonsillitis .....	16		knee	
„ .....	Erysipelas .....	1	Croupous Lar-	Diphtheria	1
„ .....	Erythema .....	1	yngitis		
„ .....	Varicella .....	1	Sent in with	.....	8
„ .....	Scarlatina .....	7	Mother		
„ .....	Bronchitis .....	1	Phthisis .....	.....	2
„ .....	Enteric Fever...	1	B u b o n i c	.....	1
			Plague		

29 deaths, 3 occurred within 48 hours of admission. Total mortality of other diseases 15'9 per cent.



## BAGULEY SANATORIUM FOR INFECTIOUS DISEASES.

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### MEDICAL SUPERINTENDENT'S REPORT.

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During the year ending December 31st, 1905, 348 cases were under treatment in this hospital ; of these, 44 were remaining in hospital on January 1st, 1905, and 304 were admitted during the year. The following tables will show the distribution of these cases according to the disease from which they suffered and the district from which they came, and will give, in tabulated form, the result of the treatment that they received here.

Before proceeding to this portion of the report, however, it is perhaps well to make a few general remarks.

Various urgent necessary repairs and alterations have been carried out during the year. The work has been efficiently done and carefully supervised by the Town Hall Steward, Mr. Rison, and the latter has also on several occasions obliged me when any emergency repair has been necessary here in the ordinary working of the establishment.

During the past winter the resources of the hospital were brought into play to the utmost, owing to the fact that the Medical Officer of Health found it expedient for a time to send here certain cases from districts in Manchester from which cases had not hitherto been received into this hospital. One marked advantage of this, from the point of view of Baguley Sanatorium, was that a marked decrease in the average cost per head occurred during that period. It was found that the total actual cost of carrying on the hospital, while an average of 80 and more patients was under treatment, was very slightly more than the actual cost when the average number of patients in hospital was only 45 ; so that the daily cost per head was very much reduced. This is, of course, due to the fact that whether the patients in hospital are few or many, the same number of wards have usually to be kept working, requiring practically the same number of staff, the same amount of cleaning, the same amount of coal for ward purposes.

Practically, the only additions to cost when the number of the patients increases are for food, for laundry-work, and engine-coal, though the ' wear and tear ' of furniture, fittings, linen, and woollen goods, etc., is naturally greater when the patients are more numerous,

*Fatality Percentage.*

The *percentage fatality* on all cases in 1904 was 4·48 per cent. ; that for 1905 is 6·64 per cent. This increase is due chiefly to a large increase in the fatality of *Diphtheria* cases, which has risen from 5·71 per cent. in 1904 to 17·02 in 1905. But in this connection it may be stated that of 8 deaths from *Diphtheria* occurring here during 1905, no less than 5 died within 48 hours, and one within 3 days of admission. Under the section “*Diphtheria*,” further remarks will be found in regard to these cases.

The fatality amongst *Scarlet Fever* cases in 1904 was 6 = a percentage of 3·20.

The fatality amongst *Scarlet Fever* cases in 1905 was 8 = a percentage of 3·88.

The following tables give a general review of the cases treated during the year :—

LIST A.—*All cases—Present in Hospital on January 1st, 1905, and admitted during 1905.*

DISTRICT	Cases in Hospital on Jan. 1st, 1905	Admitted	Discharged	Died	Cases in Hospital on Jan. 1st, 1906	Total Cases discharged or who have died	Death-rate per cent.
Withington .....	12	86	56	3	39	59	$\frac{3}{59} = 5\cdot08$
Moss Side.....	8	47	48	1	6	49	$\frac{1}{49} = 2\cdot04$
Levenshulme ...	7	31	31	1	6	32	$\frac{1}{32} = 3\cdot12$
Bucklow .....	17	95	91	10	11	101	$\frac{10}{101} = 9\cdot80$
Other Districts...	0	12	9	1	2	10	$\frac{1}{10} = 10\cdot0$
Private Cases ...	0	11	10	1	0	11	$\frac{1}{11} = 9\cdot09$
Manchester .....	0	22	8	*1	13	9	$\frac{1}{9} = 11\cdot11$
Totals .....	44	304	253	18	77	271	$\frac{18}{271} = 6\cdot64$

\* This case was sent in as Enteric Fever, but was not suffering from that disease.

LIST B.—All cases admitted during 1905—Divided according to their diagnosis, and the districts from which they came.

DISTRICT	Scarlet Fever	Diphtheria	Enteric Fever	Cases sent in as one disease found on admission to be suffering from another	Cases found on admission to be suffering from two or more diseases — mixed infections	TOTAL
Withington .....	61	18	1	3	3	86
Moss Side.....	44	0	1	2	0	47
Levenshulme ...	19	12	0	0	0	31
Bucklow .....	60	26	1	2	6	95
Other Districts...	11	1	0	0	0	12
Private Cases ...	11	0	0	0	0	11
Manchester .....	20	0	0	1	0 + 1 case of Measles	22
Totals .....	226	57	3	8	9 + 1 case of Measles	304

In addition to these, one case from Bucklow—included in mixed infections—had *Enteric* and *Scarlet Fever* on admission.

SCARLET FEVER.

The total number under treatment during the year was 267; divided as follows :—

LIST C.—Scarlet Fever only.

District	Cases in Hospital on Jan. 1st, 1905	Admitted	Discharged	Died	Cases in Hospital on Jan. 1st, 1906	Death- rate per cent.
Withington ...	11	61	41	2	29	4.65
Moss Side .....	8	44	46	1	5	2.12
Levenshulme...	6	19	20	0	5	—
Bucklow .....	16	60	66	3	7	4.34
Other Districts.	0	11	8	1	2	11.11
Private Cases...	0	11	10	1	0	9.09
Manchester ...	0	20	7	0	13	—
Totals .....	41	226	198	Male 4 Female 4 } 8	61	3.88

Percentage fatality—1905—3.20.

„ „ —1906—3.88.



The incidence of *Scarlet Fever* according to age and sex is shown by the following table:—

LIST D.—*Incidence of Scarlet Fever according to age and sex.*

District	Age 1 to 5		Age 5 to 10		Age 10 to 20		Age over 20		Totals		
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total
Withington ...	6	7	13	18	5	7	1	4	25	36	61
Moss Side ...	2	7	10	6	5	5	4	5	21	23	44
Levenshulme..	2	1	5	8	1	1	1	0	9	10	19
Bucklow .....	10	6	10	12	11	8	2	1	33	27	60
Other Districts	0	3	2	4	1	1	0	0	3	8	11
Private Cases..	0	0	2	4	4	0	1	0	7	4	11
Manchester ...	2	1	8	3	1	4	1	0	12	8	20
Totals .....	22	25	50	55	28	26	10	10	110	116	226
Totals .....	47		105		54		20		226		

The following complications occurred:—

LIST E.—*Complications.*

Complication	No. of times occurring	Percentage on cases discharged
Single Otorrhœa—		
On admission .. .. .	7	3·53
After admission .. .. .	9	4·64
Double Otorrhœa—		
On admission .. .. .	5	2·52
Occurring after admission.. .. .	10	5·05
Nasal Discharge—		
On admission .. .. .	15	7·57
Occurring after admission.. .. .	44	22·22
Simple Adenitis—		
On admission .. .. .	37	18·13
Occurring after admission.. .. .	19	9·59
Suppurative Adenitis .. .. .	1	·505
Nephritis (with Hæmaturia) .. .. .	3	1·51
Rheumatism .. .. .	5	2·52
Endocarditis .. .. .	1	·505
Myocarditis .. .. .	1	·505
Quinsy .. .. .	1	·505
Chorea .. .. .	1	·505
Pneumonia .. .. .	1	·505

In connection with the above list, it is interesting to note that the average stay in hospital of patients who had *Double Otorrhœa* before and on admission was 91·8 days; the average stay of those who developed Double Otorrhœa in hospital was 81·6 days. It will be well to bear this fact in mind when noticing, later on, the total average stay in hospital of Scarlet Fever patients. The number of patients under treatment during the year is so small that a long stay on the part of a few raises the average very considerably.

In spite of the fact that 37 cases of Scarlet Fever had marked *enlargement of the submaxillary glands*, on admission, only one case developed *suppuration* in a gland. I consider that this result is due in some measure to the treatment adopted in the earlier stages of the patients' stay in hospital.

Only 3 cases of *Nephritis* occurred. I see no reason to alter my opinion, expressed in my Report for 1904, that the smallness of the number of cases suffering from this complication in this hospital last year (4) and this year (3) is due, in some measure, to the fact that the skin of every case is made to act very freely from the earliest days in hospital, with a view to getting rid of the poison that may have been absorbed, and so relieving the kidneys from subsequent damage from overwork.

#### *Diphtheria Antitoxin in Scarlet Fever.*

I have continued to employ the *Diphtheria Antitoxin* in bad cases of *Scarlet Fever*, and I see no reason to think otherwise in regard to its good result in certain cases than I did last year. It is true that 3 of the cases to which I administered this serum died subsequently, but 2 of them were absolutely hopeless cases from the first, and the third one—a case of Malignant Scarlet Fever of a very bad type—lived for 23 days, and seemed at one time likely to win through. I shall continue to accumulate further evidence on this point, and I wish that some one with more cases at his disposal than I have would think it worth while to take up this matter.

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#### RETURN CASES.

Four patients sent out from this hospital during the year seem definitely to have given rise to other cases of Scarlet Fever. In two other instances a patient was sent in to hospital from houses to which patients had returned home after being here in Scarlet Fever wards.

In the first of these latter two instances, a boy who had been in hospital 47 days, and had had *Right Otorrhœa* during that time, was sent home on March 18th, and on May 4th—47 days later—his brother came into hospital suffering from Scarlet Fever.

Nothing was found in the first case after his discharge from hospital that was likely to cause infection, and the brother had been attending school before he caught Scarlet Fever. These facts render it not impossible that the infection of the second case was not due to the return home of the first case.

In the second instance, a child, G.P., female, age  $3\frac{1}{2}$  years, left hospital on December 9th after a stay of 38 days. Her attack had been so mild that all through her stay in hospital there was suspicion that she was not suffering from Scarlet Fever. On December 31st her little brother, A.P., age  $2\frac{1}{2}$  years, came in certified as Scarlet Fever. No definite signs of this disease ever showed themselves in this child in here, and after a short stay—35 days—the child was sent home. It is necessary to add, although this correctly appertains to 1906, that a month later another boy of the same family came in with Scarlet Fever. This series of cases seems interesting, and one would like to know if possibly there was some overlooked source of infection.

With regard to the four originating cases above-mentioned :—

1. K.J., female, age 7, left hospital January 7th, after a stay of 48 days. Her sister came in suffering from Scarlet Fever on January 15th.

2. A boy, age 6, left this hospital on October 18th after a stay of 47 days. He had been troubled with *large tonsils and adenoid growths* during the whole time, but his throat seemed to be free from congestion, his skin to be smooth, and his mucous membranes to be normal when he left hospital; nevertheless, on December 13th, his sister was taken to Monsall Hospital suffering from Scarlet Fever.

3. A boy, age 3, left hospital on February 4th. When admitted to hospital this child had *Left Otorrhæa*, and had had it for some time. This persisted in spite of all treatment until shortly before he went home, after a stay in hospital of 112 days. I learned later that the ear discharge commenced again almost immediately, and on February 14th his brother came in with a most virulent attack of Scarlet Fever, and died in 4 days.

4. A girl, age 6, came to hospital on March 31st with Scarlet Fever. She had *Double Otorrhæa* on admission, very large tonsils, and adenoid growths, and I was informed that her left ear had been discharging for over 3 years. She stayed in hospital 73 days, and for the last ten days of her stay there was no discharge whatever from either ear. I was informed later by the father that it was not until 3 weeks later that discharge from one ear recommenced—the same ear that had been previously discharging for over 3 years. She left hospital on June 15th, and on July 12th—27 days later, and 5 days after the recommencement of the ear discharge—her brother, age  $1\frac{3}{4}$  years, was admitted here with Scarlet Fever. His case was practically hopeless from the first, and he died in 8 days.



It seems worthy of note that the two worst cases of Scarlet Fever that came into this hospital during the year followed the return home of two cases that had suffered from *ear discharge*. This would seem to be an argument in favour of some surgical interference in these very chronic cases of ear discharge ; and if one could be sure that such interference would effectually cure the discharges, one might be led to recommend it in a certain small number of cases ; but there is no doubt, in my opinion, that a great number, nay the majority, of ear-discharges clear up completely, and, as far as can be judged from the non-occurrence of return cases, permanently, under continuous energetic treatment, such as douching and syringing with antiseptic solutions.

### *Relapses.*

A.—Only 2 cases arose where definite recurrence of the throat symptoms was noted. In both these cases the throat assumed the appearance seen in an ordinary Scarlet Fever throat in the early stages ; the relapses both occurred in the convalescent ward on or about the 40th day after admission, and in each case the patient went home within 3 weeks of that time ; no peeling followed the relapse, and no return case resulted after patient was discharged.

B.—Three cases went through what appeared to me to be two definite attacks of Scarlet Fever. It would take too long to give details, but in each instance I had noted typical Scarlet Fever peeling as the result of the illness from which the patient suffered on admission, and in each case I saw, from beginning to end, the second attack. I had no doubt—nor have I—that these children suffered from two distinct attacks of Scarlet Fever. In these cases also the second attack began in the convalescent wards, also about the sixth or seventh week after admission to hospital.

It has been suggested to me that a possible explanation of some relapses or second attacks might be that if a case comes under treatment in the early stages, and very energetic measures are taken, the first attack may be “aborted,” with a possible result that sufficient natural antitoxin is not formed in the body of the child to make it immune from the accumulation of infection in a ward ; and that the reason why these attacks should take place in the convalescent rather than the acute wards is that in the latter the children are—for the most part—in bed, while in the former they are all playing about and mixing together.

### *Diphtheria.*

During the year 1905, 57 cases of *Diphtheria* were admitted to hospital. Of these 8 died—a percentage of 17·02. Of these 8 cases, 5 died within 48 hours of admission ; one other within 3 days.

It is generally recognised that antitoxin is a necessity for the cure of a bad case of *Diphtheria*, and that if the administration of this is delayed until after the fifth or sixth day of illness, the chances for the child are getting rather

small. The following summary of the cases that died in this hospital during the year is interesting in regard to this matter:—

## SUMMARY OF ALL CASES OF DIPHTHERIA THAT ENDED FATALLY DURING 1905.

Case	Sex	Age	Days ill before admission	Antitoxin administered before admission	Day of illness on which A.T. was administered	State on Admission	Length of Life in Hospital
14	f.	3	6 or 7 days. Mother thought child was suffering from mumps	No.	On admission	Hæmorrhages from nose and mouth; membrane over both tonsils and uvula, severe dyspnoea	About 60 hours
19	f.	4½	10 days	No.	Eleventh	Child had stopped breathing when admitted. Tracheotomy performed. Colour never properly returned. Toxæmic and Broncho-Pneumonia	About 36 hours
22	f.	6	15 days	Yes. 4,000 units on 15th day	15th and 16th	Urgent dyspnoea, great toxæmia, tracheotomy	About 40 hours
30	f.	5	According to history--3 days. According to appearance on admission--about 7 or 8 days	No.	On admission	Old membrane covering both tonsils--uvula--and part of soft palate, profuse thick N.D.	About 40 hours
35	f.	2	??? Has been <i>croupy</i> for 3 clear days	No.	On admission	In extremis. Tracheotomy	About 6 hours
133	f.	8	No definite history	No.	On admission and again 2 days later	Hæmorrhagic with petechiæ and subcutaneous hæmorrhages	About 5½ days
139	f.	2	No definite history	No.	On admission	Child did not seem very poorly, but died with Convulsions later. Had profuse Diarrhœa most of time in hospital	9½ days
230	f.	1	Had been poorly for 3 weeks. Eventually swab found to contain d.b. Antitoxin given on about 18th day	About 18th day	More Anti-toxin on admission	Very ill indeed. Pneumonia.	About 40 hours



The great caution employed in regard to allowing Diphtheria patients to resume the upright position, and the effect of this upon the stay in hospital, has been referred to. No case is allowed to leave hospital until one swab, and sometimes two, has been cultured and found to be "Negative for d.b." No return case has occurred. In view of the high fatality and failure to administer antitoxin above recorded, I am happy to say that the giving of antitoxin to cases of Diphtheria before admission to hospital is becoming much more general amongst the practitioners in the districts from which this hospital usually receives patients.

During the year 59 cases were under treatment:—

LIST F.—*Diphtheria*.

District	In Hospital, on January 1st, 1905		Admitted during 1905		Total	Discharged during 1905	Died during 1905	Remaining in Hospital on January 1st, 1906	Total
	M.	F.	M.	F.					
Withington ...	0	1	5	13	19	10	1	8	19
Moss Side .....	—	—	0	0	0	—	0	0	0
Levenshulme ...	—	—	3	9	12	10	1	1	12
Bucklow .....	1	0	8	18	27	18	6	3	27
Other Districts	—	—	1	0	1	1	0	0	1
Totals .....	1	1	17	40	59	39	8	12	59
Totals .....	2		57		59	Percentage Fatality, $\frac{8}{47} : 17.02$			

LIST G.—*Diphtheria Admissions. Age incidence according to Districts.*

District	Age 1 to 5		Age 5 to 10		Age 10 to 20		Age over 20		Totals		Total
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
Withington .....	1	6	1	3	2	2	1	2	5	13	18
Moss Side.....	—	—	—	—	—	—	—	—	0	0	0
Levenshulme .....	1	3	1	2	1	3	0	1	3	9	12
Bucklow .....	2	5	2	8	1	2	3	3	8	18	26
Other Districts.....	—	—	1	0	—	—	—	—	1	0	1
Private Cases .....	—	—	—	—	—	—	—	—	0	0	0
Manchester .....	—	—	—	—	—	—	—	—	0	0	0
Totals .....	4	14	5	13	4	7	4	6	17	40	57
Totals .....	18		18		11		10		57		...



*Average stay in hospital in days. All cases discharged or who have died during 1905.*

District	Scarlet Fever		Diphtheria		Enteric Fever		Double Infections		Altered Diagnosis		Deaths—all Diseases		Total average stay in hospital in days	
	Cases	Average stay	Cases	Average stay	Cases	Average stay	Cases	Average stay	Cases	Average stay	Number	Average length of life in Hospital	Cases	Average stay
Withington .....	41	61·95	11	50·09	1	56	1	50·0	3	40·33	3	15·66	60	56·08
Moss Side .....	46	57·39	0	.....	1	20	0	.....	1	31·0	1	4·0	49	55·00
Levenshulme .....	20	63·05	10	67·20	1	58	0	.....	0	.....	1	10·	32	64·53
Bucklow .....	66	61·51	17	61·50	1	38	5	71·2	1	22·0	10	4·20	100	55·56
Other Districts .....	8	59·25	*1	97·00	.....	.....	.....	.....	.....	.....	1	19·	10	59·00
Private Cases .....	10	54·30	0	.....	.....	.....	.....	.....	.....	.....	1	23·	11	51·45
Manchester.....	7	44·57	0	.....	.....	.....	.....	.....	1 case of Measles	22·0	1	12·	9	38·44
Totals .....	198	59·74	39	60·46	4	43	6	59·33	6	32·66	18	8·72	271	55·78

\* Caught Scarlet Fever in Hospital.

## ENTERIC FEVER.

### A.—*Remaining in Hospital on January 1st, 1905 :—*

One case, male, age 32. From Levenshulme. Stay in Hospital—  
58 days. *Recovery.*

### B.—*Admitted during 1905 :—*

One case, male, age 47. From Withington. Stay in Hospital—  
56 days. *Recovery.*

One case, female, age 12½. From Moss Side. Stay in Hospital—  
20 days. *Transferred to Monsall.*

One case, female, age 11½. From Bucklow. Stay in Hospital—  
38 days. *Recovery.*

### *Diseases contracted during stay in hospital.*

1. Two cases sent in as Scarlet Fever *caught Scarlet Fever* in hospital. I was suspicious of these cases from the beginning, but was unable at the time to give them a separate ward. Both cases recovered from their attack of Scarlet Fever. Neither had any complication. One was in 48 days, the other 42 days after commencement of attack, and neither gave rise to a return case, although going home to join a large family of children. This is a slight point in favour of the contention that the stay in hospital would be shortened, and the chances of complications or of return cases would be lessened, if cases of Scarlet Fever could receive energetic treatment from the very first onset.

2. Three cases sent in as Diphtheria *caught Scarlet Fever* in hospital. Three other cases of Diphtheria, sent in after a throat swab had shown the presence of Diphtheria Bacilli, were found later on to be peeling in a manner typical of Scarlet Fever. They were isolated immediately. All the other patients were transferred to another ward. The ward itself was thoroughly cleaned and disinfected, and all toys and books were burnt, but unfortunately these steps were evidently too late to prevent the three cases above-mentioned occurring subsequently. All the cases occurred about the same time, no others have occurred. None of these cases ended fatally, I am happy to say.

### *Stay in hospital.*

The average duration of stay in hospital of all cases is comparatively high—as it was last year.

The average stay of *Scarlet Fever* cases was 59·74 days.

„ „ „ *Diphtheria* „ 60·46 „

„ „ „ cases of *all diseases* was 55·78 „

Several factors go to explain these high figures.

1.—*With regard to Scarlet Fever cases :—*

A.—The total number of cases being small, a long stay on the part of a few raises the general average considerably. Cases of Double Otorrhœa referred to above, for instance, stayed in for an average of 85.57 days each.

One case with Single Otorrhœa stayed in 86 days, and another one 72 days.

One case of Nephritis had to be kept in for 105 days.

On the other hand, out of 198 cases discharged, 60 cases (a percentage of over 30) remained in hospital for less than 50 days.

B.—A considerable number of cases admitted are suffering from very large tonsils and adenoid growths. It is a very slow process getting rid of all infection from such spongy tissue.

C.—I am more than ever convinced that even a very small remainder of the original ring of punctate redness upon the edge of the soft palate, or upon the pillars of the fauces, is sufficient to cause a "return case" if circumstances favour it, and I therefore keep patients back even at the last moment rather than allow any case with such redness, however slight, to go home. In a few cases I had an opportunity to observe that, if left untreated for a day or two, the tiny patch of redness observed one day usually grew and spread along the path of the original ring of redness until, if left untreated for long enough, a definite ring would appear again similar to that seen in the throat in the early stages of Scarlet Fever.

If this is established as a fact by the observation of others with a greater number of cases than I can have here, it would seem to show that not until the last sign of redness has disappeared from that ring, which is so marked and general a sign of Scarlet Fever, is the throat free from the germs which cause the disease. I therefore, as a rule, now keep the children for two days in a clean ward, *untreated*, before sending them home, in order to be sure that no recrudescence of the throat congestion occurs.

2.—*With regard to Diphtheria cases :—*

The chief cause of the long stay of these cases is that, with a view to avoiding that terrible catastrophe "sudden heart failure," I am exceedingly cautious about allowing any child that has had Diphtheria to sit up, feeling that it is necessary to accustom the child, by very gradual stages, to the upright position.

T. BASIL RHODES,

*Medical Superintendent.*

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## REPORT BY MR. A. T. ROOK, SUPERINTENDENT OF THE SANITARY DEPARTMENT.

Sanitary Department,  
Town Hall, Manchester.

In presenting to the Medical Officer of Health the report of the work transacted in the Sanitary Department for the year ending 30th April, 1905, I beg to state that the City, for inspection and other purposes, is divided into 29 Districts, to each of which one Sanitary Inspector has been assigned.

In addition to these, there is a Superintendent, one Chief Inspector, two Drainage, five Smoke, one Canal Boats, one Lodging-house, three Adulteration of Food, one Milkshops, six Factory and Workshops Inspectors, including two Female Inspectors, and two Drain Examiners.

There is also a staff of 28 Clerks for clerical and other work.

In the House Drainage Department there is also a Manager, ten Clerks, and eight Clerks of Works for supervising and measuring up work done by the contractors employed by the department in carrying out private drainage work.

The number of complaints of nuisances of various kinds made during the year was 2,815, viz. :—

553	through the Medical Officer of Health's Department.
1,412	by the Public.
53	through the Police.
797	by the Staff.

### HOUSES LET IN LODGINGS.

Under the powers given by Section 90 of the Public Health Act, the bye-laws made thereunder have been enforced.

The number of houses on the register is 1,300.

To these, 3,065 day visits and 258 night visits have been paid.

Sixty-three infringements of the regulations have been reported and dealt with.

### DAIRIES, MILKSHOPS, AND COWSHEDS REGULATIONS.

Under this Order, which was made in July, 1879, and the Regulations thereunder in 1896, 2,934 milkshops and dairies and 81 cowkeepers are now on the register. The number of cows kept is 1,133. The number of visits to dairies, milkshops, and cowsheds was 3,104. Four cowsheds have been closed as being unfit for use on sanitary grounds.

Many of the cowsheds have been much improved since last year, but there are still a few in an unsatisfactory condition, and steps are being taken to improve these.

## WORKSHOPS, BAKEHOUSES, SHOP HOURS, AND SEATS FOR SHOP ASSISTANTS ACTS.

During the year the Acts have been well observed, only a few persons having been reported for infringements. Shop Hours and Seats for Shop Assistants Acts.

Much has been done to still further improve the condition of workshops, especially those in which females are employed, and every care has been taken to see that in all cases separate and suitable sanitary accommodation for the sexes has been provided. Workshop Acts.

With regard to means of escape in case of fire, the whole of the factories and workshops in the City have been inspected, and with very few exceptions are now considered safe. Means of escape in case of fire.

Periodical changes will, of course, from time to time take place in various ways which will bring buildings within the meaning of the Act, and necessitate the constant supervision of the Inspectors, and action on the part of the authorities.

During the year 61 of the worst bakehouses in the City have been absolutely closed, and a number of others have been reported by the Medical Officer of Health to be unfit for use until satisfactory alterations are made to place the premises in a better sanitary condition. Bakehouses.

Extensive alterations have been made in a few of the bakehouses, and 16 certificates of fitness have been granted.

Many visits have been paid to houses in various parts of the City in which out-work is carried on, as will be seen on reference to the following tabulated statement, but constant visitation is necessary to maintain the standard of cleanliness which is to be desired, especially in houses in which shirt-making, handkerchief-hemming, brace-making, and umbrella-covering, etc., is done. Out-workers.

The people, as a rule, appear willing to carry out any suggestion made by the Inspectors to keep their houses clean ; but at the same time it is almost impossible for small houses, sometimes containing large families, to be kept in such a satisfactory condition as workshops.

This Act, without the necessity of any legal proceedings, has been complied with by all the shopkeepers of the City. Seats for Shop Assistants Act.

The work done under the above Acts is shown in the following tables.



TABLE SHOWING THE WORK DONE BY THE INSPECTORS UNDER THE SHOP HOURS, SEATS FOR SHOP ASSISTANTS, AND FACTORY AND WORKSHOP ACTS.

INSPECTOR	SHOPS					SHOPS					WORKSHOPS						OUT- WORKERS		BAKEHOUSES								
	Shop Hours Act					Seats for Shop Assistants Act					Number of visits	Number in which Sanitary Defects were found	Number of Reports referred to H.M. Inspector (unregistered factories, &c.)	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits to houses where out-workers are employed	Number of houses found dirty.	Factories and Workshops not provided with proper means of escape in case of fire	Number of visits	Number in which Sanitary defects were found	Number of reports referred to H.M. Inspector of Factories	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register		
	Number of visits	Number of Infringements of Act reported	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits	Number of infringements of Act reported	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register																	
1	633	...	...	...	708	199	3431	342	103	1	216	1430	3	...	3	...	...	...	3	455	24	...	1	...	...	...	85
2	622	...	...	...	1071	399	3226	325	46	1	171	1161	7	...	7	...	...	...	5	569	47	4	...	...	18	...	181
3	725	...	...	...	470	186	1511	230	50	3	119	951	1	...	1	...	...	...	1	1482	30	3	1	...	...	...	137
4	841	...	...	...	595	302	2994	307	147	...	357	1264	3	...	3	...	...	...	2	868	23	3	...	...	2	...	113
...	2098	146	1	95	...	...	1719	152	...	13	...	...	859	73	...	...	...	...	...	...	...	...	...	...	...	...	...
...	1724	152	2	155	...	...	1385	95	...	4	...	...	2377	56	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTALS ...	6643	298	3	253	2844	105	14266	1451	346	22	863	4806	3250	129	11	3374	124	10	2	20	516						



TABLE SHOWING THE NUMBER AND CLASSIFICATION OF PERSONS EMPLOYED  
AS OUTWORKERS BY FIRMS WITHIN THE CITY, AND THE NUMBER OF  
SUCH FIRMS.

TRADES	No. of Employers	No of Outworkers or Contractors employed
Tailors .. .. .	190	942
Shirt Makers .. .. .	49	801
Dress, Mantle, Costume, &c., Makers .. ..	50	577
Underclothing and Pinafore Makers .. ..	47	423
Handkerchief Hemmers .. .. .	16	342
Boot, Slipper, &c., Makers .. .. .	43	171
Umbrella Trimmers .. .. .	35	257
Quilt, Cushion, &c., Makers .. .. .	5	35
Stay and Corset Makers .. .. .	2	6
Cabinet Makers, Upholsterers, &c. .. ..	9	18
Paper Bag Makers .. .. .	3	10
Rubber Workers .. .. .	2	2
Lace Makers .. .. .	2	7
Optician .. .. .	1	2
Fur Workers .. .. .	3	3
Hair Pad and Frame Makers .. .. .	3	11
Cap Makers .. .. .	3	6
Belt and Trimming Makers .. .. .	1	8
Totals .. .. .	464	*3621

\* 3148 of these are in the City, the remainder are in the districts of other Local Authorities  
to whom they have been sent.

## PROSECUTIONS FOR OFFENCES, WITH RESULTS.

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed		Amount of Costs ordered to be Paid		Dismissed or Withdrawn
			£	s. d.	£	s. d.	
		HOURS ACT.					
Frederick Burton ...	730, Ashton Old Road, Open-shaw	Not exhibiting Abstract of Shop Hours Act in shop	0	3	0	3	Withdrawn
John T. Holroyd....	136, Wilmslow Road, Fallowfield	Ditto	0	9	0	9	Withdrawn
		WORKSHOP ACT					
Barnett Broymtman ..	48, Waterloo Road, Cheetham ..	Neglecting to limewash his workshop after notice	0	10	0	8	6
Louis Bernstein.....	5, Jackson Street, London Road	Ditto	0	10	0	8	6
Jemima Bonehill.....	101, Oxford Street, City.....	Ditto	.....	.....	.....	.....	Withdrawn
Kate Dudley .....	9, South Parade, City .....	Neglecting to abate overcrowding of workshop after notice	0	3	0	3	Withdrawn
Simon Rubenstein...	37, Bury New Road, Cheetham...	Having his bakehouse in a dirty state	1	1	0	8	6
Philip Ginsberg .....	Harris Street, Cheetham .....	Occupying insanitary premises as a bakehouse	1	0	0	9	0
James Simpson Blair	19-27, Great Ancoats Street....	Not forwarding list of outworkers to Local Authority	And order made to discontinue		0	3	6
		Carried forward.....£	3	1	2	14	0

PROSECUTIONS FOR OFFENCES, WITH RESULTS—continued.

Name of Offender	Address of Offender	Offence	Amount of Fine Imposed	Amount of Costs ordered to be Paid	Dismissed or Withdrawn
	FACTORY AND WORKSHOP		£ s. d.	£ s. d.	
Richard Davies .....	28A, High Street, City .....	Brought forward.....	3 1 0	2 14 0	
John Wm. Harrison.		ACT—continued.			
Arthur Lewy & Co...	39, Blackfriars Street, City ....	Not forwarding list of outworkers to Local Authority			Withdrawn (lists sent in)
Jacob Libstein.....	13, China Lane, Piccadilly.....	Ditto			Ditto
Walter Sutton .....	Derby Street, Cheetham .....	Ditto		0 3 6	Withdrawn
Crispin Yeo .....	1, Victoria Arcade, City.....	Ditto		0 3 6	Ditto
Hill & Brown .....	Cathedral Chambers, City .....	Ditto		0 3 6	Ditto
Albert E. Brooksbank	46, & 48 Deansgate .....	Ditto		0 3 6	Ditto
Jonathan Brooks & Co.	18, Corporation Street .....	Ditto		0 8 6	Ditto
Jane Colls.....	21, Marsden Square.....	Ditto		0 11 6	Ditto
F. Flitcroft & Co.....	77, Great Ancoats Street.....	Ditto			Ditto
H. E. Randall Ltd...	4, Lever Street .....	Ditto		0 3 6	(deceased)
Attwood Walmsley Sinclair	35, Oldham Street .....	Ditto		0 8 6	Withdrawn
Morris Harry Saffer..	35, John Dalton Street.....	Ditto		0 8 6	Ditto
John A. Wood Ltd...	190, London Road .....	Ditto		0 3 6	Ditto
	Mount Street Mills, Harpurhey..	Ditto		0 6 0	Ditto
Total .....			3 1 0	6 1 6	



## SMOKE NUISANCES.

For the abatement of smoke nuisances, the four Inspectors appointed specially for this work have taken 458 timed observations of half-an-hour each, with the result that 88 notices for the abatement of nuisances have been served. Proceedings before the Magistrates have been ordered in 115 cases out of 177 offences reported. These cases were disposed of as follows:—

One hundred and fifteen were summoned before the Justices, in 87 of which fines were imposed amounting to £207 2s. od., and costs £65 16s. 6d. Eight were ordered to pay costs only.

Twelve orders of abatement were granted and served, 9 cases were excused, dismissed, or withdrawn. (In one case a fine was imposed in addition to an order of abatement being granted.)

Much attention during the past year, as will be seen by the above, has been given to the nuisance caused by the emission of black smoke, not only from the furnaces connected with boilers in mills, warehouses, and other works, but also from chemical and other industries, and the efforts made have already resulted in a considerable reduction of the nuisance. It may be stated that representations have been made to other Authorities on the North-East and West sides of the City in regard to the great pollution of the air of the City by the excessive emission of smoke from the chimneys in their districts.

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SALE OF FOOD AND DRUGS ACTS AND MARGARINE ACT.

Table showing the number of Articles of Food and Drugs procured for Analysis, the number Adulterated, the number informally purchased or in which no proceedings were taken, and the number of cases in which Magisterial Proceedings were taken.

May 1st, 1873, to April 30th, 1905.

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates				Year ending April 30th, 1905					
				No. Summoned	No. Fined	No. of Warrants granted	No. ordered to pay Costs only— Dismissed or Withdrawn	No. of Samples Procured	No. Adulterated	No. Summoned	No. Fined	No. ordered to pay Cost only	No. Dismissed or Withdrawn
Arrowroot .....	6	...	...	...	...	..	...	...	...	...	...	...	...
on .....	1	...	...	...	...	...	...	...	...	...	...	...	...
ing Powder.....	52	...	...	...	...	...	...	11	...	...	..	...	...
f Dripping .....	4	...	...	...	...	...	...	1	...	...	...	...	...
r .....	544	72	34	38	19	...	19	40	...	...	...	...	...
ad .....	1167	39	7	32	32	...	...	29	...	...	...	...	...
ter .....	2675	395	33	362	287	3	72	237	25	19	14	...	5
termilk.....	2	2	2	...	...	...	...	...	...	...	...	...	...
phorated Oil .....	5	...	...	...	...	...	...	...	...	...	...	...	...
ese .....	279	11	4	7	6	...	1	36	1	1	1	...	...
cory .....	43	...	...	...	...	...	...	...	...	...	...	...	...
er.....	3	...	...	...	...	...	...	...	...	...	...	...	...
oa .....	49	...	...	..	...	...	...	10	...	...	...	...	...
l Liver Oil .....	6	...	...	...	...	...	...	...	...	...	...	...	...
fee .....	651	40	2	38	37	...	1	59	...	...	...	...	...
fectionery .....	343	2	...	2	2	...	...	16	...	...	...	...	...
am .....	15	...	...	...	...	...	...	1	..	...	...	...	...
gs .....	510	13	12	1	1	...	...	84	3	...	...	...	...
n (tinned).....	7	...	...	...	...	...	...	...	...	...	...	...	...
ur.....	206	...	...	...	...	...	...	34	...	...	...	...	...
it (tinned) .....	2	...	...	...	...	...	...	...	...	...	...	...	...
as .....	302	1	...	1	1	...	...	28	...	...	...	...	...
y .....	2	...	...	...	...	...	...	...	...	...	...	...	...
chup .....	1	...	...	...	...	...	...	...	...	...	...	...	...
d .....	776	27	5	22	18	...	4	35	...	...	...	...	...
rgarine .....	181	...	..	...	...	...	...	34	...	...	...	...	...
ats (tinned) ..	9	...	...	...	...	...	...	...	...	...	...	...	...
k .....	22701	1579	27	1552	1062	..	490	1093	55	52	36	...	16
k (skimmed) .....	151	23	...	23	18	...	5	...	...	...	...	...	...
k (condensed) .....	9	...	...	...	...	...	...	...	...	...	...	...	...
eral Waters, &c....	278	79	76	3	...	...	3	...	...	...	...	...	...
Carried forward.....	30980	2283	202	2081	1483	3	595	1748	84	72	51	...	21

ANALYSIS—continued.

Article	No. Procured	No. Adulterated	No. informally purchased or in which no proceedings were taken	No. Summoned before Magistrates				Year ending April 30th, 1905					
				No. Summoned	No. Fined	No. of Warrants granted	No. ordered to pay Costs only—Dismissed or Withdrawn	No. of Samples Procured	No. Adulterated	No. Summoned	No. Fined	No. ordered to pay Cost only	No. Dismissed or Withdrawn
Brought forward ....	30980	2283	202	2081	1483	3	595	1748	84	72	51	...	21
Mustard.. .....	391	46	6	40	34	..	6	26	...	...	...	...	...
Oatmeal.....	201	...	...	...	...	...	...	29	...	...	...	...	...
Olive Oil ....	12	1	...	1	1	...	...	...	...	...	...	...	...
Pearl Barley .....	10	...	...	...	...	...	...	9	...	...	...	...	...
Pepper .....	718	7	...	7	6	...	1	57	...	...	...	...	...
Pickles .....	4	...	...	...	...	...	...	...	...	...	...	...	...
Porter .....	8	...	...	...	...	...	...	...	...	...	...	...	...
Rice, Tapioca, &c.....	131	...	...	...	...	...	...	16	...	...	...	...	...
Shrimps .....	8	4	4	...	...	...	...	...	...	...	...	...	...
Spices .....	306	1	...	1	...	...	1	27	...	...	...	...	...
Spirits .....	1422	67	10	57	52	...	5	157	8	8	7	1	...
Sugar.....	65	...	...	...	...	...	...	...	...	...	...	...	...
Tea .....	440	10	7	3	2	...	1	33	...	...	...	...	...
Treacle & Golden Syrup	67	...	...	...	...	...	...	5	...	...	...	...	...
Tripe .....	1	...	...	...	...	...	...	...	...	...	...	...	...
Vegetables (tinned) ...	17	9	8	1	...	...	1	...	...	...	...	...	...
Vinegar.....	127	8	...	8	7	...	1	...	...	...	...	...	...
Wines .....	35	...	...	...	...	...	...	...	...	...	...	...	...
Totals.....	34943	2436	237	2199	1585	3	611	2107	92	80	58	1	21

Other Offences against the Acts.

Offence	No. Summoned	No. Fined	No. Dismissed or Withdrawn	Total amount of Fines imposed		
				£	s.	d.
Refusing to serve Inspector with Samples of Food .....	22	22	...	73	2	6
Giving False Warranty .....	20	6	14	46	0	0
Obstructing Inspector in the execution of his duty.. .....	2	1	1	5	0	0
Selling Milk from a vehicle which had not the name and address of the person inscribed thereon .....	5	5	...	1	0	6
Selling Margarine in an unstamped wrapper.....	6	3	3	0	6	0
Ditto Margarine Cheese .....	1	1	...	0	5	0
Totals.....	56	38	18	£125	14	0
Total amount of Penalties for Adulteration.....				£4,087	2	6
Total amount of Penalties for Other Offences.....				125	14	0
Grand Total.....				£4,212	16	6
Total amount of Penalties against Farmers .....				£1,953	8	0



## CANAL BOATS ACTS.

The number of canal boats on the register is 499.

The number of inspections made was 1,866, resulting in three infringements of the Act being discovered, which were referred to the Justices to be dealt with. In two of the cases fines were imposed amounting to 7s. 6d., with costs 14s. One case was excused.

Fifty-six caution notices were sent to the owners and masters.

## OFFENSIVE TRADES.

The number of offensive trades on the register is 723. These have been placed under close supervision, and periodical visits paid.

## UNHEALTHY DWELLINGS.

During the year, 756 houses were certified to be dealt with by the Sanitary Committee.

Of these, 638 were ordered to be closed.

In the majority of these the owners arranged to make alterations to meet the requirements of the Corporation.

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PARTICULARS RELATING TO THE OPERATIONS OF THE  
CLEANSING DEPARTMENT.

Cleansing Department,

Town Hall, Manchester,

June 5th, 1906.

Dear Sir,—There are within the City:\* pail-closets, 65,477; ash-boxes, 80,792; midden-privies, 19,262; wet middens, 10,049; dry middens, 1,227; water-closets, 67,638; and cesspools, 53. The pail-closets are systematically emptied at regular intervals—once, twice, or thrice weekly, as necessity demands. The midden-privies are emptied as required. The contents of the pail-closets are taken to Holt Town and Water Street. At Holt Town the fæcal matter is dried into concentrated manure. The dry refuse is consumed in the Galloway boilers, and generates the steam required for working the machinery. The worthless fine ash, which cannot be consumed, is deposited at the nearest tip at Clayton Vale. The privy refuse and fæcal matter, which is taken to Water Street, is sent away in its crude state as nightsoil to Carrington and Chat Moss Estates and to farmers in Cheshire. Dry combustible matter is passed into the destructor furnaces or under the Galloway boilers at Water Street, and there destroyed. A large quantity of fine ash at Water Street is used as an absorbent for the fæcal matter from the pail-closets.

The market garbage, of which we have 6,240 tons per annum, is carted to Water Street, and destroyed in the furnaces. Slaughter-house refuse is collected from the abattoirs and private slaughter-houses and sent to Holt Town, where

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\* Inclusive of the District of Moss Side.

it is passed through dryers, and the dry material is then added to the concentrated manure. Street sweepings are generally deposited at the nearest depot, and after being allowed to drain are carted to the nearest tip, or to the Water Street Depot, from whence they are sent away by boat to farmers or the Committee's Estates. The total quantity of material collected by this Department during the past year amounted to 350,343 tons.

We have within the City about 41 destructor furnaces of various kinds, and last year 9,240 tons of mortar was made from the clinker obtained from such furnaces.

We employ about 49 "orderly" youths and men, who collect horse-droppings and litter from the streets, and deposit the same in the bins fixed in the footpaths. The contents of the bins are removed twice daily, and taken to the nearest depot.

Acting upon instructions received from you, special pails and lids are supplied for all cases of Enteric Fever; labels are attached to the pails asking the occupants of the house to use disinfectants, which are supplied with the pails; the pails are left in the yard, and not placed in the ashplace. The occupants are requested to use this special pail for the reception of the fæcal matter and washings from the patient only. The pails are removed in a specially-constructed vehicle, and taken to Holt Town Depot, where the contents are destroyed.

With regard to the cleansing of passages, we have a staff of about 34 men engaged specially upon this work. They regularly, at least once a week, cleanse the back passages in certain districts, and during last year 366,091 swillings and cleanings were effected in courts and passages.

During the year, 89,621 barrels of water were used in degging the streets, and 344,129 grids were unstopped.

During the past 15 years, we have deposited upon the various tips within the City the following quantities of material, viz. :—In 1892, 99,866 tons; 1893, 109,078 tons; 1894, 103,949 tons; 1895, 113,836 tons; 1896, 107,883 tons; 1897, 99,658 tons; 1898, 96,635 tons; 1899, 104,481 tons; 1900, 95,138 tons; 1901, 64,781 tons; 1902, 117,619 tons; 1903, 180,985 tons; 1904, 141,999 tons; 1905, 118,093 tons; and in 1906, 109,446 tons. The bulk of this material was deposited on the tips at Clayton and Harpurhey. It is composed principally of dry ashes, street sweepings, and bell-dust. Occasionally the contents of dry middens are sent there. During last year 14,963 tons of material was sent to Carrington Estate and 56,178 to Chat Moss Estate.

Yours faithfully,

Dr. Niven,

Medical Officer of Health,

Town Hall, Manchester.

R. WILLIAMSON,

*Superintendent.*

## DEPARTMENT OF MEAT INSPECTION.

City Abattoirs,  
Manchester.

To the Chairman and Gentlemen,  
Markets Committee.

The Chief Veterinary Inspector has pleasure in submitting the following report of the amount of unwholesome food condemned under the Public Health Acts, 1875, during the year ending December 31st, 1905 :—

## ABATTOIRS AND CARCASE MARKET.

The number of animals slaughtered in the Abattoir, Water Street, during the 12 months were :—

Cattle	Sheep	Lambs	Calves	Pigs
26,762	120,895	50,849	1,699	12,487

The number of carcasses exposed for sale in the Dead Meat Market, Water Street were :—

	Beasts	Sheep	Lambs	Calves	Pigs
Abattoir killed ..	24,430	114,168	48,539	491	1,544
Fresh ..	42,416	26,557	235	17,804	15,760
Imported Chilled & Frozen	18,749	173,844	42,397	84	28,515
Total .. ..	<u>85,595</u>	<u>313,769</u>	<u>91,171</u>	<u>18,379</u>	<u>45,819</u>

Beasts, Sheep, and Pigs Offals :—

Imported and exposed in the	Fresh .. ..	1,288,000lbs.
Meat Market	Chilled and Frozen	2,012,400 „

## RUSHOLME ABATTOIRS.

The number of animals slaughtered at the Abattoir, Monmouth Street, Rusholme were :—

Beasts	Sheep and Lambs	Calves	Pigs
656	6,404	212	3,592

## MOSS SIDE ABATTOIRS.

The number of animals slaughtered at the Abattoir, Denmark Road, Moss Side were :—

Beasts	Sheep and Lambs	Calves	Pigs
164	1,087	1	3,458

## PRIVATE SLAUGHTER-HOUSES.

The amount of slaughtering executed in the private slaughter-houses is approximately estimated in the following figures :—

	Cattle	Sheep and Lambs	Pigs
Beef Butchers .. .. .	8,679	40,786	—
Pork „ .. .. .	—	—	16,380



## UNSOUND FOOD.

The amount of unwholesome food condemned during the year is summarised in the following tables :—

*Meat and Fish.*

Beef .....	156,874 lbs.
Mutton .....	5,295 „
Veal .....	2,521 „
Pork .....	17,464 „
(Imported Offals) ...	21,648 „

Total .....203,802 lbs.

Fish .....	280,273 lbs.
Shellfish .....	74,216 „

Total .....354,489 lbs.

*Game and Rabbits.*

Black Game .....	138½ brace
Partridge .....	105 „
Pheasants .....	26 „
Ptarmigan .....	26 „
Grouse .....	1 head
Hares .....	120 „
„ .....	1 case
Rabbits.....	2,032 head and 2 cases

*Poultry.*

Fowl .....	757 head
„ .....	1 basket
Pigeons .....	126 head
Ducks .....	35 „
Turkeys .....	22 „

*Fruit.*

Plums .....	432½ packages
Black Currants ...	213½ „

*Fruit—continued.*

Gooseberries .....	106 packages
Strawberries .....	157 „
Apricots .....	25 „
Cherries .....	17 „
Raspberries .....	1 „
Pears .....	46 cases
„ .....	5 barrels
Tangerine Oranges..	6 bundles
Oranges .....	8 cases
Bananas .....	5 crates
Apples .....	4½ barrels
Tomatoes .....	190 boxes

*Vegetables.*

Beans .....	150 packages
Mushrooms .....	63 „
Parsley .....	59 „
Lettuce .....	51 pots
Onions .....	33 bags
Sprouts .....	26 pots
Red Cabbage .....	25 bags
Beet Root .....	22 baskets
Cress .....	18 boxes
Radishes .....	11 pots
Cucumbers.....	5 baskets
Salad .....	4 boxes
Potatoes.....	1 barrel
Marrows.....	1 load, 1 ton 14 cwt.

*Miscellaneous.*

Condensed Milk .....	188 boxes
Eggs .....	108
Yeast .....	9 packages

*Number of Seizures and reasons therefor.*

The number of carcasses, portions of carcasses, and consignments of fish, etc., condemned during the year has been 2,125, and from the following causes :—

Decomposing.....	1,330	Actinomycosis.....	4
Tuberculosis .....	341	Rheumatism .....	4
Unmarketable .....	96	Pericarditis .....	3
Emaciation .....	59	Unseasonable .....	3
Fluke .....	53	Milk Fever .....	3
Smothered .....	48	Hydatids .....	3
Inflammation .....	37	Nephritis .....	3
Dropsy .....	30	Fatty Degeneration .....	2
Fevered .....	22	Parasites .....	2
Injured.....	17	Purpural Spotted .....	2
Abscesses .....	12	Pleurisy .....	2
Choked .....	10	Sarcosporidia .....	1
Black Quarter.....	10	Septicæmia .....	1
Bone Taint .....	6	Joint Disease .....	1
Peritonitis .....	6	Mammitis .....	1
Tumours .....	6	White Scour .....	1
Pneumonia .....	5	Enteritis .....	1

The following table will show where the meat and fish were condemned, and amounts taken from each place :—

In the Abattoir and Carcase Market .....	184,709 lbs.
of which 112,279 lbs. was dressed meat con-	
signed from other places than the City,	
21,648 lbs. being imported offals.	
„ Pig Market .....	7,698 „
„ Cold Air Stores .....	3,397 „
„ Private Slaughter-houses .....	3,283 „
„ Triperies .....	2,299 „
„ Shops .....	1,211 „
„ Warehouses.....	120 „
„ Hawkers' Carts .....	115 „
„ Crumpsall Workhouse.....	40 „
„ Private Piggery .....	35 „
„ Railway Stations .....	23,026 „
„ Fish Markets .....	332,358 „

The game, rabbits, poultry, fruit, vegetables, and miscellaneous :—

*At Fish Markets.*

Black Game .....	138½ brace
Partridge .....	105 „
Pheasants .....	26 „
Ptarmigan .....	26 „
Pigeons .....	126 head
Ducks .....	30 „
Turkeys .....	22 „
Fowl .....	511 „
Hares .....	120 „
Rabbits .....	1,601 „
„ .....	2 cases

*At Smithfield Market.*

Rabbits .....	53 head
Plums .....	432½ packages
Black Currants ...	213½ „
Strawberries .....	127 „
Gooseberries .....	106 „
Apricots .....	25 „
Raspberries .....	1 „
Pears .....	46 cases
„ .....	5 barrels
Oranges .....	8 cases
Tangerine Oranges..	6 bundles
Bananas .....	5 crates
Apples .....	4½ barrels
Tomatoes .....	190 boxes
Beans .....	150 packages
Mushrooms .....	63 „
Parsley .....	59 „

*Smithfield Market—continued.*

Lettuce .....	51 pots
Onions .....	33 bags
Sprouts .....	26 pots
Beet Root .....	22 baskets
Cress .....	18 boxes
Radishes .....	11 pots
Cucumbers.....	5 baskets
Salad .....	4 boxes
Potatoes.....	1 barrel
Marrows.....	1 load, 1 ton 4 cwt.

*At Railway Stations.*

Fowls .....	244 head
Duck .....	1 „
Red Cabbages .....	25 bags
Strawberries .....	30 packages
Cherries .....	17 „
Yeast .....	9 „

*Shops.*

Rabbits .....	378 head
Duck .....	4 „
Fowl .....	2 „
Eggs .....	108 boxes

*Cold Air Stores.*

Hares .....	1 case
Fowl .....	1 basket
Grouse .....	1 head

*Warehouse.*

Condensed Milk ....	188 boxes
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*Particulars of Inspection.*

With the exception of 481 lbs. of meat, 210 lbs. of fish, and 32 of ducks, the whole of the above amounts have been surrendered\* by the trade after being condemned by the Inspectors.

In addition to the supervision of the abattoirs and other markets, there have been 1,708 visits made to private slaughter-houses (52 being at the request of the butchers), and 8,315 carcasses examined in them. Of these, 56 carcasses and

\* The term surrender includes cases in which the Inspector has discovered the diseased meat in the course of his duty.



portions of 10 others were condemned as unfit for human food (comprising 51 pig carcasses, 2 sheep, and 3 beast carcasses).

There have been 7,405 visits made to the meat, fish, fruit, and provision shops in the poorer districts of the City. Of these, 280 were made on Sunday morning. Thirty-seven shopkeepers have been cautioned for having small amounts of unsound food in their possession.

The triperies, sausage, and pie factories have been regularly inspected, but nothing of an objectionable nature has been discovered.

Forty-five visits have been made to the railway stations, with a view to ascertain what consignments of meat and fish are consigned direct to shops and not coming to our markets for inspection.

Four orders for the destruction of unwholesome food have been obtained at the City Police Courts.

Twelve hundred and fifty-six official certificates have been granted (upon request) to the meat and fish salesmen of the markets for the purpose of being forwarded to their senders as a guarantee of what has been condemned.

ALFRED HOLBURN,

*Chief Veterinary Inspector.*

## CONTAGIOUS DISEASES OF ANIMALS.

### GLANDERS.

During the year there has been one outbreak of glanders; one horse was found affected with the disease, and was immediately slaughtered by order of the Local Authority.

The value of the horse was estimated at £50, and the owner compensated in accordance.

### SWINE FEVER.

There have been no outbreaks of swine fever within the City during the past 12 months.

### PARASITIC MANGE.

Thirteen outbreaks of parasitic mange in horses have been dealt with under the Manchester (Parasitic Mange) Order, 1903.

Under this Order two horse-owners have been prosecuted: one for neglecting to notify the existence of disease, and the other for failing to treat the disease as often as necessary. In each case a fine of £5 and costs was imposed.

### PIG MARKET.

The Pig Market, Water Street, has been visited daily by the Inspectors under the Swine Fever Order, 1894, and the Swine Fever (Movement from Ireland) Order, 1904, all cases of infringement of such Orders being immediately reported to the Board of Agriculture and Fisheries, or dealt with by the Inspectors.

### RAILWAY STATIONS.

Three hundred and fifty visits have been made to the Railway Stations and Cattle Docks for the purposes of the Animals (Transit and General) Order of 1895.

### HORSE MARKET.

The Horse Market has been visited each month by a Veterinary Inspector, as required by the Glanders and Farcy Order, 1894.

ALFRED HOLBURN,  
*Chief Veterinary Inspector.*

## Report on the Health of the Withington District in 1905,

BY DR. RAILTON, DISTRICT MEDICAL OFFICER OF HEALTH.

The total number of deaths among persons belonging to the Withington District during the year 1905 amounted to 382—184 males and 198 females.

It is made up of the following figures:—

Deaths of residents within the district	.. .. .	340
„ „ „ in the Chorlton Union Workhouse		25
„ „ „ in localities outside the district	..	17
		<hr/> 382

The population of the district in June, 1905, being taken as 38,000, the death-rate is calculated to be 10·05. The corresponding rate for 1904 was 11·8.

The births during the year were 792, and the birth-rate was 20·8, compared with 20·4 in 1904.

The death-rates and birth-rates of the different townships are respectively as follows:—

	Death-rate	Birth-rate
Withington (including Whalley Range) .. .. .	11·3	18·5
Didsbury .. .. .	7·7	16·4
Chorlton-cum-Hardy .. .. .	10·0	27·4
Burnage .. .. .	12·4	24·9





INFANTILE MORTALITY.

*Deaths under one year per thousand births. Different townships compared.*

TOWNSHIP	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905
Withington . . . . .	140	120	92	142	157	94	175	103	139	110	89
Didsbury . . . . .	100	96	81	118	50	128	89	80	92	93	66
Chorlton-cum-Hardy . . . . .	90	90	84	152	90	121	78	105	80	105	67
Burnage . . . . .	140	148	165	132	102	114	255	95	89	104	164

*Deaths throughout the district in children under five years of age from 1893 to 1905.*

NAME OF DISEASE	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905
Measles . . . . .	...	7	5	1	11	2	1	6	1	15	6	1	6
Scarlet fever . . . . .	2	...	...	...	...	2	...	4	1	2	3	1	...
Whooping Cough . . . . .	3	1	2	9	4	5	5	3	5	1	12	9	2
Diphtheria and mem- branous croup	2	...	...	3	...	4	2	3	3	3	1	1	3
Enteric fever . . . . .	...	...	1	...	...	...	...	...	...	...	...	...	...
Epidemic influenza... .	1	...	1	...	2	3	1	1	1	2	...	2	3
Diarrhœa . . . . .	17	...	14	6	8	12	19	7	22	3	7	7	7
Enteritis . . . . .	...	...	...	...	...	...	...	...	3	...	3	4	2
Erysipelas . . . . .	...	...	...	...	...	...	...	...	1	...	1	...	...
Tuberculosis . . . . .	...	...	...	...	...	...	...	...	14	8	10	9	5
Bronchitis, pneumonia, pleurisy, etc.	17	11	13	23	14	19	9	13	11	22	9	21	13
All other causes . . . . .	63	51	50	56	51	72	58	69	52	54	50	52	48
Total... .	105	70	86	98	90	119	95	106	114	110	102	107	89

*Deaths of all persons belonging to the district in 1905 and previous  
four years.*

NAME OF DISEASE							1901	1902	1903	1904	1905
Smallpox	...	...	...	...	...	...	...	...	..	...	...
Measles	...	...	...	...	...	...	1	17	6	1	7
Scarlet fever	...	...	...	...	..	...	1	7	3	3	1
Whooping cough	...	...	...	...	...	...	5	1	12	9	2
Diphtheria and membranous croup	...	...	...	...	...	...	6	6	2	3	4
Croup	...	...	...	...	...	...	...	...	1	1	...
Fever	{	Typhus	...	...	...	...	...	...	...	...	...
		Enteric	...	...	...	...	1	1	1	2	2
		Other continued	...	...	...	...	...	...	...	...	...
Epidemic influenza	...	...	...	...	...	...	10	11	5	7	11
Cholera	...	...	...	...	...	...	...	...	...	...	...
Plague	...	...	...	...	...	...	...	...	...	...	1
Diarrhœa	...	...	...	...	...	...	24	3	7	7	8
Enteritis	...	...	...	...	...	...	4	1	3	4	2
Puerperal fever	...	...	...	...	...	...	1	...	...	...	1
Erysipelas	...	...	...	...	...	...	3	1	2	1	2
Other septic diseases	...	...	...	...	...	...	3	7	2	2	2
Phthisis	...	...	...	...	...	...	26	27	38	29	20
Other tubercular diseases	...	...	...	...	...	...	17	11	14	11	9
Cancer, malignant disease	...	...	...	...	...	...	37	32	35	31	32
Bronchitis	...	...	...	...	...	..	24	30	22	50	35
Pneumonia	...	...	...	...	...	...	42	35	21	33	26
Pleurisy	...	...	...	...	...	...	...	2	3	1	2
Other diseases of respiratory organs	...	...	...	...	...	...	1	6	4	1	3
Alcoholism, cirrhosis of liver	...	...	...	...	...	...	4	8	10	11	5
Venereal disease	...	...	...	...	...	...	...	1	3	...	...
Premature birth	...	...	...	...	...	...	2	5	13	13	9
Diseases and accidents of parturition	...	...	...	...	...	...	2	...	5	2	...
Heart diseases	...	...	...	...	...	...	53	36	36	45	46
Accidents	...	...	...	...	...	...	6	6	5	7	2
Suicides	...	...	...	...	...	...	3	7	5	6	3
Injuries	...	...	...	...	...	...	1	...	1	2	...
All other causes	...	...	...	...	...	...	136	151	151	157	147
Total							413	412	410	439	382

*Death-rates per thousand of the population from the principal diseases  
given in the above table, 1901 to 1905.*

NAME OF DISEASE	1901	1902	1903	1904	1905
Measles ... ..	0·02	0·48	0·16	0·02	0·18
Scarlet fever ... ..	0·02	0·20	0·08	0·08	0·02
Whooping cough ... ..	0·14	0·02	0·33	0·24	0·05
Diphtheria and membranous croup ...	0·17	0·17	0·05	0·08	0·10
Enteric fever ... ..	0·02	0·02	0·02	0·05	0·05
Epidemic influenza ... ..	0·29	0·30	0·13	0·18	0·28
Diarrhœa ... ..	0·70	0·08	0·19	0·18	0·21
Phthisis ... ..	0·76	0·77	1·05	0·78	0·52
Other tubercular diseases ... ..	0·50	0·31	0·38	0·29	0·23
Cancer, malignant diseases ... ..	1·08	0·91	0·97	0·83	0·84
Diseases of the respiratory organs ...	1·97	2·08	1·38	2·29	1·73
Alcoholism, cirrhosis of liver ... ..	0·11	0·22	0·27	0·29	0·13
Heart diseases ... ..	1·55	1·02	1·00	1·21	1·21

The zymotic death-rate (Measles, Scarlet Fever, Whooping Cough, Diphtheria, Membranous Croup, Enteric Fever, Puerperal Fever, Plague, Erysipelas, and Diarrhœa) amounts to 0·73.

*Zymotic death-rates of the different townships.*

Withington, including Whalley Range .. ..	0·66
Didsbury .. ..	0·29
Chorlton-cum-Hardy .. ..	1·10
Burnage .. ..	1·49



*A summary of the action taken during the year for preventing the spread of disease.*

*Smallpox.*—No case occurred.

*Measles.*—The following table shows the distribution of the disease throughout the district as regards month and place:—

Month	Withington	Didsbury	Chorlton-cum-Hardy	Burnage	Total
January .. .. .	—	1	—	—	1
February .. .. .	1	—	—	1	2
March .. .. .	3	—	—	1	4
April .. .. .	1	—	37	1	39
May .. .. .	10	2	33	—	45
June .. .. .	86	4	—	—	90
July .. .. .	5	26	—	—	31
August .. .. .	—	1	1	—	2
September .. .. .	—	—	—	—	—
October .. .. .	—	—	—	—	—
November .. .. .	—	—	—	—	—
December .. .. .	—	1	—	—	1
	106	35	71	3	215

Chorlton-cum-Hardy and Withington have been the chief sufferers from this disease, the former township in April and May and the latter in June. No school was closed on account of the epidemic, but the schools concerned have always been warned of the occurrence of any case, and other members of the family have not been allowed to attend. Printed precautions have been left at the houses in which the disease has occurred and also at other houses in the immediate neighbourhood.

The 7 deaths from measles, 6 of which were in children under 5 years of age, give a case mortality of 3·2 per cent.

*Scarlet Fever.*—The following table shows the number and distribution of cases of Scarlet Fever, and the number of patients removed to hospital, during the year 1905 :—

Month	Withington	Didsbury	Chorlton-cum-Hardy	Burnage	Total	Number removed to Hospital
January .. .. .	1	1	4	—	6	5
February .. .. .	1	3	1	1	6	1
March .. .. .	3	1	1	—	5	2
April .. .. .	2	2	1	—	5	1
May .. .. .	5	5	—	—	10	1
June .. .. .	2	—	1	—	3	2
July .. .. .	1	1	2	—	4	2
August .. .. .	1	1	5	—	7	3
September .. ..	1	—	9	2	12	7
October .. .. .	5	2	16	1	24	14
November .. .. .	4	2	26	—	32	17
December .. ..	6	—	16	—	22	12
	32	18	82	4	136	67

Chorlton-cum-Hardy during the last quarter of the year suffered considerably from the prevalence of both this fever and Diphtheria.

The attack-rate for the whole district was 3·5 per thousand, compared with 2·1 in 1904.

The case mortality for 1905 was 0·7 per cent., compared with 3·7 per cent. in 1904.

In May a series of 11 cases occurred in various parts of the district, all resembling one another in the fact that they had the same milk supply, either directly from the cow-keeper (4 cases) or through the school at which all the other patients (7 cases) took milk supplied by the same man. The onset of these cases was between May 6th and May 8th inclusive. The rash in some instances was indistinguishable from that of Scarlet Fever, and was followed by desquamation. The tonsils were inflamed and enlarged, papillæ occurred on the tongue. The peeling was more perceptible, as a rule, upon the feet than upon the hands.

In several instances the rash consisted of a large papular erythema. Similar cases arose from the same source in the adjoining part of Fallowfield. The milk farm, which is situated in Fallowfield, was subjected to a rigid examination.

*Diphtheria and Membranous Croup.*—A large number of cases of Diphtheria have occurred in the district during the year, as shown in the following table :—

Month	Withington	Didsbury	Chorlton-cum-Hardy	Burnage	Totals	Number removed to Hospital
January .. .. .	3	—	1	—	4	3
February .. .. .	1	1	—	—	2	—
March .. .. .	1	1	—	2	4	3
April .. .. .	1	2	—	2	5	2
May .. .. .	—	—	1	—	1	1
June .. .. .	—	—	—	—	—	—
July .. .. .	—	—	1	—	1	—
August .. .. .	1	1	—	—	2	1
September .. .. .	—	—	1	—	1	—
October .. .. .	1	—	1	—	2	1
November .. .. .	—	1	14	—	15	9
December .. .. .	5	1	7	—	13	4
	13	7	26	4	50	24

The average number of cases per annum during the past 10 years has been 22. Chorlton-cum-Hardy, in November and December, suffered more than any of the other townships.

During the year 83 swabs were examined, and in 24 instances Diphtheria Bacilli were found to exist, but of these 5 were cases which had been previously examined. Of the actual 50 cases of the disease notified, 19 only were tested, while in the remaining 31 cases there was no test.

The attack rate for the whole of the district was 1·3 per thousand, compared with 0·7 in 1904.

The case mortality for the year was 8 per cent., compared with 10·7 per cent. in 1904.

Thirty-five phials of Diphtheria antitoxin were supplied to the medical profession of the district during the year.



*Whooping Cough.*—The district has been remarkably free from this disease during the year, and two deaths only were registered, both of them in infants under one year.

*Enteric Fever.*—Six cases of Enteric Fever were reported during the year, two of which proved fatal. The average yearly number of cases during the previous ten years was 12.

Month	Withington	Didsbury	Chorlton-cum-Hardy	Burnage	Totals	Number removed to Hospital
January .. .. .	I	I	—	—	2	I
February .. .. .	—	—	—	—	—	—
March .. .. .	I	—	—	—	I	—
April .. .. .	—	—	—	—	—	—
May .. .. .	—	I	—	—	I	—
June .. .. .	—	—	—	—	—	—
July .. .. .	—	—	—	—	—	—
August .. .. .	—	—	—	—	—	—
September .. ..	I	I	—	—	2	—
October .. .. .	—	—	—	—	—	—
November .. ..	—	—	—	—	—	—
December .. .. .	—	—	—	—	—	—
	3	3	—	—	6	I

In one only of the above was the Typhoid reaction obtained, the test not being applied in the rest.

In 14 other instances the test was made, but with a negative result. The attack-rate for the whole district was 0·15, compared with 0·13 per thousand in 1904.

The case-mortality was 33·3 per cent.

*Plague.*—A fatal case of this disease occurred in Whalley Range in the person of a young sailor who left his ship at Middlesbrough on June 8th, feeling unwell, reached his home on the 9th, was removed to hospital on the 10th, and died there on the 12th. The plague bacilli were found.

The premises, after the above cases of Scarlet Fever, Diphtheria and Plague, were thoroughly disinfected by stripping the walls, washing down with solution of chlorinated lime and stoving the bedding.

During the course of a case of Enteric Fever, a pail for the evacuations has been provided and changed weekly. On the termination of any case, both water-closets and ashpits have been thoroughly disinfected with a solution of corrosive sublimate.

*Erysipelas*.—13 cases of Erysipelas were notified during the year, two of which died. In each case enquiries were made as to whether a monthly or district nurse was in attendance. In one instance it was found that a monthly nurse was living in the house. She was at once warned, and went to live elsewhere during the continuance of the case, taking precautions as regards her clothing and instruments. In a second case a district nurse was attending; she was also warned, and took all due precautions. In the other cases there were no nurses.

*Puerperal Fever*.—One case of this disease occurred. The patient was removed to the Chorlton Union Hospital, where she died. The bed was stoved, and the dresses and instruments of two nurses who had been in attendance were disinfected.

*Phthisis*.—20 deaths from Phthisis were recorded in 1905. In only two instances of these was the sputum examined. Disinfection was carried out completely after 16 fatal cases, and partially in 3 others. The remaining case occurred in a public institution. 56 specimens of sputum were examined during the year, with the result that in 17 the tubercle bacilli was found to be present.

In addition to disinfection after fatal cases, it was carried out during life in 8 other instances after removals, etc.

The following table shows the number of cases in which rooms and bedding have been disinfected after Phthisis for each year since the practice was commenced (March 8th, 1900):—

	1900	1901	1902	1903	1904	1905
Fatal cases of Phthisis . . . . .	38	26	27	38	29	20
Rooms of patients disinfected, paper stripped, walls washed down with 1 per cent. chloride of lime solution, and bedding stoved . .	11	20	20	30	24	24
Partial disinfection . . . . .	3	1	4	1	2	3
Disinfection refused . . . . .	24	5	3	7	7	..

The above figures relate to all patients suffering from Phthisis reported either as having died or as having removed to other premises.

*Removal to Hospital.*—The number of patients removed to hospital is as follows :—

Disease	Baguley Sanatorium	Monsall Hospital	Chorlton Union Workhouse
Diphtheria .. .. .	22	—	2
Erysipelas .. .. .	—	2	2
Scarlet Fever .. .. .	63	2	2
Enteric Fever .. .. .	1	—	—
Puerperal Fever .. .. .	—	—	1
Plague .. .. .	—	1	—
	86	5	7

The number of patients who have suffered from Scarlet Fever, Diphtheria, and Enteric Fever in the district in each of the years from 1895 to 1905, together with the annual number of removals to hospital, is shown in the following table :—

Year	Number of Cases of Fever in the District	Removed to Hospital	Percentage
1895	S.F. 102. D. 22. E. 20—Total 144 .. ..	49	34
1896	S.F. 120. D. 13. E. 10— „ 143 .. ..	63	44
1897	S.F. 177. D. 16. E. 10— „ 203 .. ..	121	59
1898	S.F. 70. D. 22. E. 25— „ 117 .. ..	54	46
1899	S.F. 68. D. 16. E. 16— „ 100 .. ..	28	28
1900	S.F. 204. D. 14. E. 8— „ 226 .. ..	120	53
1901	S.F. 245. D. 31. E. 11— „ 287 .. ..	162	56
1902	S.F. 109. D. 26. E. 6— „ 141 .. ..	73	51
1903	S.F. 85. D. 31. E. 14— „ 130 .. ..	58	44
1904	S.F. 80. D. 28. E. 5— „ 113 .. ..	43	38
1905	S.F. 136. D. 50. E. 6— „ 192 .. ..	92	47



*Disinfection.*—The total number of articles stoved in 1905 was 6,622, and consisted of the following :—Beds, 301; mattresses, 182; pillows, 799; blankets, 604; counterpanes, 303; carpets, 458; various articles of clothing, 2,564; and sundries, 1,411.

*Water supply of the Withington District.*

The greater part of the district is supplied with Manchester water coming from the Audenshaw reservoir, but there are many outlying farms and other premises which are still dependent upon shallow wells. All the milk farms, however, are supplied with Manchester water with the exception of Demesne Farm, Whalley Range. The water of the pump in this case has again been analysed during the past year, and found to be fairly satisfactory. The well has recently been puddled with clay outside the brickwork to a depth of 6 feet, in order to prevent the entrance of polluting material from the surrounding soil.

*Building in the district during 1905.*—The total number of houses certified as fit for habitation during the year ending December 31st, 1905, was 362, distributed as follows :—Withington 211, Didsbury 23, and Chorlton-cum-Hardy 128. In all these the drains and other sanitary arrangements have been tested by the Inspector of New Buildings.

*Notices served during the year for the alteration of insanitary conditions.*

	Notices	Houses concerned
Under Section 46 M.I. Act, 1845 .. ..	8	8
Under Section 41 M.N.S. Act, 1853 ..	4	22
Under Section 41 P.H. Act .. .. .	49	171
Under Sections 91 to 94 P.H. Act .. ..	63	157
Town Clerk Notices .. .. .	19	27
	143	385

Insanitary premises altered without notices—61.

Premises inspected as to their sanitary condition after the notification of cases of infectious fever, including Phthisis—195.

Premises disinfected after fevers, including Phthisis—189 houses (297 rooms).

Premises smoke-tested—11.

Water-closets of approved pattern substituted for privies—137.

*Dairies and Cowsheds.*—The cowsheds have been regularly inspected during the year, and with one exception, have been kept in a satisfactory condition.

In the one case excepted, it was found necessary to warn the cowkeeper to keep his premises in a cleaner condition, and since then they have been frequently visited by the Inspector, and have been maintained in a much better state.

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REPORT ON THE ADMINISTRATION OF THE FACTORY AND WORKSHOP ACT, 1901,  
IN SO FAR AS THIS ADMINISTRATION IS IN THE HANDS OF THE WITHINGTON  
COMMITTEE, AND IS CONCERNED WITH MATTERS IN THE DEPARTMENT OF  
THE DISTRICT MEDICAL OFFICER OF HEALTH.

I.—*Workshops.*

The number of workshops now on the register is 537.

The cubic capacity of each workshop has been measured, and cards have been placed in each room showing the maximum number of workpeople allowed.

Attention has been given to the cleanliness and ventilation of the workshops.

In 46 cases the walls and ceilings of the workshops were found to be in a dirty condition, and verbal instructions were given by the Inspector to have the premises cleansed.

This request has, in each instance, been sufficient to cause the premises to be cleansed without legal notice.

In 7 workshops the sanitary accommodation was found to be unsatisfactory, and was reported by the Inspector to the Medical Officer of Health. In 4 instances there was no accommodation for the workmen. In 2 instances satisfactory closet accommodation has been provided upon a verbal request being made. In another the men have been allowed to use a water-closet in the immediate vicinity. In the fourth case the owner of the premises has been served with a notice to provide sanitary accommodation.

In the three remaining cases, certain defects existing in the closets were made good after verbal instructions being given, and legal notices have not been necessary.

In 2 instances overcrowding of the workshops was found, but the nuisance has been abated at once upon verbal instructions being given.

2.—*Bakehouses.*

There are now on the register 40 bakehouses, which, on the whole, are kept in a clean and satisfactory condition. In 32 instances during the year it has been found necessary to call the attention of the occupiers to the state of the walls, etc., and to request them to have them cleansed. In all cases this has been done without legal notice.

All the bakehouses comply with the Act in not having any sanitary convenience or ashpit communicating directly with them; in not having any cistern for supplying water to them connected in any way with a water-closet; in having no drain openings inside; and in having no sleeping place connected with them.

The bakehouses are distributed over the district as follows :—

Chorlton-cum-Hardy .. .. .	14
Withington .. .. .	18
Didsbury .. .. .	7
Burnage .. .. .	1
	—
	40

There are no cellar-bakehouses in the district.

3.—*Homework.*

Information with regard to persons in the district taking in homework from places of business outside the district has been received in 22 instances during the year. These premises have been inspected and registered, as in the case of other workshops. The number of visits paid during the year to premises in which homework has been carried on is 104. No infectious fevers have been notified during the year as occurring in connection with the premises occupied by homeworkers.

In 4 instances employers living in this district have been reported as giving out work to homeworkers who live in other districts. The names and addresses of these homeworkers have been sent to the sanitary authorities of the districts in which they live.

4.—*Workplaces.*

Under this heading the following are classified :—

New buildings in course of erection, 55; fish and game shops, 13; Cab-yards and stables, 11; slaughter-houses, 4; total 83.

In the case of new buildings, it was found that in 6 instances no sanitary accommodation existed for the workmen. A verbal request was sufficient to have satisfactory accommodation provided. In 4 instances the accommodation provided for the men was found to be unsatisfactory, but upon a verbal request being made the necessary alterations were carried out.

Total number of visits to workplaces during the year, 373.



5.—*Factories.*

There are 19 places in the Withington district in which mechanical power is used.

These are as follows :—

Laundries, 6 ; printers, 3; bootmakers, 2; joiners, 2; cycle makers, 2; brickworkers, 2 ; sawmill, 1 ; and blacksmith, 1.

Total number of visits to factories during the year, 80.

*Workshops.*

Number of visits	Number in which Sanitary defects were found and reported to the Medical Officer of Health	Number of reports referred to Factory Inspector (unregistered workshops)	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register	Number of visits to houses where out-workers are employed	Factories and Workshops not provided with proper means of escape in case of fire
3208	4	10	0	71	537	104	0

*Bakehouses.*

Number of visits	Number in which Sanitary defects were found	Number of reports referred to Factory Inspector	Number of cases in which Magisterial proceedings have been taken	Number registered during the year	Total number on register
339	0	0	0	5	40

I.—INSPECTION.

Premises	Number of		
	Inspections	Written Notices	Prosecutions
Factories... ..	80	0	0
Workshops ... ..	2651	1	0
Workplaces ... ..	373	1	0
Homeworker's Premises ... ..	104	0	0
Total ... ..	3208	2	0

2.—DEFECTS FOUND.

Particulars	Number of Defects			No. of Prosecutions
	Found	Remedied	Referred to H.M. Inspector	
<i>Nuisances under the Public Health Acts :—</i>				
Want of cleanliness ... ..	78	78	0	0
Want of ventilation ... ..	0	0	0	0
Overcrowding ... ..	2	2	0	0
<i>Sanitary Accommodation (Section 22 adopted)</i>				
Insufficient ... ..	14	13	0	0
Defective ... ..	3	3	0	0
Not separate for Sexes... ..	0	0	0	0
Offences under the Factory and Workshop Act ... ..	0	0	0	0
	97	96	0	0

3.—OTHER MATTERS.

Class	Number
Matters notified to H.M. Inspectors of Factories :—	
Failure to affix abstract of the Factory and Workshop Act (S. 133) ... ..	10
Action taken in matters referred by H.M. Inspectors as remediable under the Public Health Acts but not under the Factory Act (S. 5)—	
Notified by H.M. Inspector ... ..	2
Reports (of action taken) sent to H.M. Inspectors.	0
Other ... ..	0
Underground Bakehouses (S. 101) :—	
In use during 1903... ..	8
Certificate granted { in 1904... ..	0
{ in 1905... ..	0
In use at the end of 1905 ... ..	0
Homework :—	
<i>List of Outworkers (S. 107) :—</i>	
Lists received ... ..	2
Addresses of outworkers { forwarded to other authorities	4
{ received from other authorities	22
<i>Homework in unwholesome or infected premises :—</i>	
Notices prohibiting homework in unwholesome premises (S. 108) ... ..	0
Cases of infectious disease notified in homemaker's premises ... ..	0
Orders prohibiting homework in infected premises (S. 110) ... ..	0
Workshops on the Register (S. 131) at the end of 1905 :—	
Dressmaking ... ..	128
Bootmakers ... ..	63
Joiners ... ..	31
Plumbers ... ..	23
Blacksmiths and Wheelwrights ... ..	16
Decorators ... ..	17
Millinery ... ..	36
Ironmongers ... ..	15
Cabinetmakers ... ..	14
Tailors ... ..	16
Bakers ... ..	40
Laundries ... ..	11
Hairdressers ... ..	13
Monumental Masons ... ..	5
Saddlers ... ..	7
Printers ... ..	3
Watchmakers ... ..	7
Picture Framing ... ..	1
Knitting ... ..	1
Golf Balls ... ..	1
Cycles ... ..	5
Bottling Stores ... ..	1
Brickworks ... ..	2
Workplaces ... ..	81
Total number of Workshops on Register ... ..	537



# TABLES.

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TABLE A.—MANCHESTER, 1905.

CAUSES OF DEATH AT DIFFERENT LIFE PERIODS IN THE 52 WEEKS OF THE YEAR.  
PERSONS.—(MALES AND FEMALES.)

CAUSES OF DEATH	AGES AT DEATH													
	All Ages	UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
All Causes .....	11258	2909	1350	296	149	226	252	674	918	1193	1376	1221	580	114
A.—GENERAL DISEASES.....	4435	1442	749	169	69	109	117	338	380	439	351	223	44	5
B.—LOCAL DISEASES.....	5499	893	524	103	68	104	112	292	484	689	939	833	393	65
C.—OTHER SPECIFIED DIS. :.	13	7	...	...	...	...	1	1	3	...	1	...	...	...
D.—ILL-DEFINED DISEASES...	850	457	28	...	1	...	2	2	5	3	46	130	133	43
E.—VIOLENT DEATHS .....	461	110	49	24	11	13	20	41	46	62	39	35	10	1
A.—General Diseases.														
Smallpox.. { Vaccinated .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
{ Not Vaccinated ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
{ No Statement.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cowpox .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chickenpox .....	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Measles .....	231	53	170	6	...	2	...	...	...	...	...	...	...	...
Epidemic Rose Rash .....	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Scarlet Fever.. .....	78	1	40	29	6	...	...	1	1	...	...	...	...	...
Typhus .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Plague.....	1	...	...	...	...	1	...	...	...	...	...	...	...	...
Relapsing Fever .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Influenza .....	95	3	5	...	1	3	2	7	7	18	17	23	8	1
Whooping Cough .....	195	83	107	5	...	...	...	...	...	...	...	...	...	...
Mumps .....	2	...	2	...	...	...	...	...	...	...	...	...	...	...
Diphtheria and Memb: Croup	127	7	73	41	4	1	...	...	...	...	1	...	...	...
Cerebro-spinal Fever .....	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Simple Cont: Fever.....	4	1	1	1	...	...	...	...	...	1	...	...	...	...
Enteric Fever .....	55	...	3	3	3	10	1	26	7	1	...	1	...	...
Asiatic Cholera .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Epidemic Diarrhoea .....	600	469	122	1	...	...	...	...	...	1	2	4	1	...
Diarrhoea .....	126	95	18	1	...	...	1	...	1	2	1	6	...	1
Dysentery .....	3	...	1	...	...	...	...	...	1	...	...	...	1	...
Malarial Fever.....	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Hydrophobia .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Glanders.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Anthrax .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tetanus .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Syphilis .....	42	33	4	...	...	...	1	...	2	...	2	...	...	...
Gonorrhœa, Strict: Urethra....	12	...	...	...	...	...	...	...	1	4	5	2	...	...
Puerperal.. { Septicæmia .....	19	...	...	...	...	...	6	9	4	...	...	...	...	...
{ Pyæmia .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
{ Phlegmasia Dol: ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
{ Fever.....	1	...	...	...	...	...	1	...	...	...	...	...	...	...
Infective Endocarditis .....	5	...	...	...	1	...	...	2	...	2	...	...	...	...
Epidemic Pneumonia } .....	2	...	...	...	...	...	...	2	...	...	...	...	...	...
Pneumonic Fever        }	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erysipelas .....	24	5	...	...	...	...	...	3	3	7	3	2	...	1
Septicæmia (not puerp: ).....	9	1	...	...	...	2	...	1	2	2	1	...	...	...
Pyæmia (not puerp: ).....	10	3	...	...	1	...	...	2	2	1	1	...	...	...
Phlegmon .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phagedœna .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Septic Diseases.....	5	...	...	...	2	...	...	...	2	...	1	...	...	...
Tubercular Phthisis .....	951	5	20	23	19	65	94	202	215	191	93	22	1	1
Phthisis ... ..	37	...	1	2	1	1	1	11	6	8	6	...	...	...





TABLE A, 1905—continued.

CAUSES OF DEATH	AGES AT DEATH													
	All Ages	UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
3. DISEASES OF HEART.														
Valvular Dis : Endocarditis ....	255	...	...	7	12	19	15	29	33	50	52	28	10	...
Pericarditis .....	6	...	...	...	...	1	2	...	2	...	...	1	...	...
Hypertrophy of Heart.....	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Angina Pectoris .....	18	...	...	...	...	...	1	1	2	...	7	4	3	...
Dilatation of Heart .....	108	...	...	...	...	1	3	5	14	25	36	18	6	...
Fatty Degen : of Heart .....	27	...	...	...	...	...	...	3	3	5	12	2	1	1
Syncope, Heart Disease.....	656	17	6	6	9	6	11	27	51	81	150	161	105	26
4. DIS: OF BLOOD VESSELS.														
Cerebral Hæmorrhage.....	327	1	1	...	...	...	...	3	29	68	81	100	38	6
Apoplexy, Hemiplegia.....	92	...	...	1	...	...	...	1	4	9	32	26	19	...
Aneurism ..	13	...	...	...	...	...	...	2	5	4	2	...	...	...
Senile Gangrene .....	33	...	...	...	...	...	...	...	...	1	3	21	6	2
Embolism, Thrombosis .....	11	...	...	...	...	...	...	1	2	1	4	1	2	...
Phlebitis.....	2	...	...	...	...	...	...	1	...	...	...	...	1	...
Varicose Veins .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Blood Vessels (Other Diseases)	14	...	...	...	...	...	...	...	2	...	2	6	4	...
5. DIS: OF RESPIRATORY SYS:														
Laryngitis .....	21	3	12	4	1	...	...	1	...	...	...	...	...	...
Memb: Laryng: (Not Diphth:)	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Croup .....	2	...	2	...	...	...	...	...	...	...	...	...	...	...
Larynx (Other Dis:)	4	1	1	...	...	...	...	1	...	...	...	1	...	...
Bronchitis .....	1,021	211	87	4	...	6	3	11	45	100	214	213	107	20
Pneumonia { Lobar .....	427	23	25	10	4	17	17	56	80	78	72	30	14	1
Pneumonia { Broncho.....	628	216	230	20	4	2	4	12	14	37	33	47	9	...
"Pneumonia".....	112	12	15	3	1	4	4	10	16	11	14	15	6	1
Emphysema, Asthma .....	32	...	...	...	...	1	...	2	4	11	9	3	2	...
Pleurisy .....	37	...	3	1	1	2	2	3	8	7	3	4	2	1
Fibroid Disease of Lung.....	3	...	...	...	...	...	...	...	1	1	...	1	...	...
Respiratory Dis: (Other) .....	50	6	4	1	...	1	1	3	3	8	6	8	9	...
6. DIS: OF DIGESTIVE SYS:														
Tonsillitis, Quinsy .....	3	1	...	1	...	...	...	...	...	...	1	...	...	...
Mouth, Pharynx .....	16	11	3	...	...	...	...	1	...	...	...	...	1	...
Gastric Ulcer.....	27	...	...	...	1	...	8	10	3	2	3	...	...	...
Gastric Catarrh.....	15	12	1	...	...	...	...	...	...	2	...	...	...	...
Stomach (Other Dis:)	55	29	5	1	...	3	1	...	...	5	4	6	1	...
Enteritis.....	39	25	10	1	1	...	...	...	1	1	...	...	...	...
Gastro-Enteritis.....	60	43	17	...	...	...	...	...	...	...	...	...	...	...
Appendicitis, Perityph : .....	27	...	...	2	4	3	7	3	4	1	2	1	...	...
Hernia .....	33	1	1	...	...	...	...	3	1	4	8	12	2	1
Intestinal Obstruct:.....	30	3	...	1	1	2	1	1	3	4	7	2	5	...
Other Diseases of Intestines ..	27	12	1	1	1	...	3	1	4	...	3	1	...	...
Peritonitis .....	29	...	...	2	4	1	...	11	5	1	2	3	...	...
Cirrhosis of Liver .....	79	1	...	...	...	...	...	4	13	27	26	7	1	...
Liver and Gall Bladder (O.D.).	41	15	...	...	...	...	1	1	3	3	9	7	2	...
Digestive System (Other Dis:)	32	22	1	...	...	1	...	1	1	2	3	1	...	...
7. DIS: OF LYMPHATIC AND DUCTLESS GLANDS.														
Spleen, Disease of.....	7	...	1	1	2	...	...	...	3	...	...	...	...	...
Lymphat: Syst: (Other Dis:)	7	...	1	...	...	...	1	1	2	1	1	...	...	...
Thyroid Body (Other Dis:)	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Supra Renal Caps: (Dis: of)...	3	...	...	...	...	1	...	...	...	1	...	1	...	...
8. DISEASES OF URINARY SYSTEM.														
Nephritis Ac:, Uræmia .....	58	4	8	2	...	2	1	5	8	10	12	5	...	1
Ch : Bright's Dis : Albumin : ...	162	...	1	...	3	5	5	14	20	39	38	29	8	...
Calculus .....	3	...	...	...	...	...	...	1	...	...	...	1	1	...
Bladder and Prostate Dis : ...	32	...	...	...	...	...	...	...	3	2	10	14	2	1
Urinary Syst : (Other Dis:)	7	...	...	1	...	...	...	1	...	2	1	2	...	...

TABLE A, 1905—concluded.

CAUSES OF DEATH	AGES AT DEATH													
	All Ages	UNDER 5 YEARS		5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85	85 and upwards
		0 to 1	1 to 5											
9. DISEASES OF GENERATIVE SYSTEM.														
Ovarian Tumour .....	6	...	...	...	...	...	...	1	3	1	...	1	...	...
Other Dis : of Ovary .....	3	...	...	...	...	...	...	...	1	...	1	...	1	...
Uterine Tumour .....	2	...	...	...	...	...	...	...	1	1	...	...	...	...
Other Dis: of Uterus and Vagina	6	...	...	...	...	...	...	1	2	3	...	...	...	...
Disord : of Menstruation .....	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Gener: and Mam: Orgs: (other)	8	...	...	...	...	1	...	3	3	...	1	...	...	...
10. DISEASES OF PREGNANCY AND CHILDBIRTH.														
Abortion, Miscarriage .....	2	...	...	...	...	...	...	...	2	...	...	...	...	...
Puerperal Mania .....	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Puerperal Convulsions .....	4	...	...	...	...	1	...	3	...	...	...	...	...	...
Placenta Præv: Flooding.....	14	...	...	...	...	...	...	9	5	...	...	...	...	...
Other Ac: of Preg: & Childbirth	12	...	...	...	...	...	3	4	5	...	...	...	...	...
11. DISEASES OF LOCOMOTOR SYSTEM.														
Caries, Necrosis .....	13	...	2	3	1	2	3	...	1	...	1	...	...	...
Arthritis, Periostitis .....	3	...	...	1	...	...	...	...	...	1	...	1	...	...
Locomotor Sys : (Other).....	4	...	1	1	...	1	1	...	...	...	...	...	...	...
12. DISEASES OF THE SKIN.														
Ulcer, Bedsore .....	9	...	...	...	...	...	...	...	1	...	2	3	3	...
Eczema .....	4	4	...	...	...	...	...	...	...	...	...	...	...	...
Pemphigus.....	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Skin Diseases (other) .....	12	3	1	...	...	...	1	...	...	3	3	...	...	1
C.—Other Specified Diseases	13	7	...	...	...	...	1	1	3	...	1	...	...	...
D.—Ill-defined and not Specified Diseases.														
Atrophy, Debility.....	543	448	28	...	1	...	...	...	...	...	7	27	23	9
Old Age .....	278	...	...	...	...	...	...	...	...	1	34	100	109	34
Dropsy, Ascites, Anasarca .....	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Tumour .....	12	1	...	...	...	...	2	1	2	1	3	2	...	...
Abscess .....	4	1	...	...	...	...	...	1	...	...	1	...	1	...
Hæmorrhage ..	2	...	...	...	...	...	...	...	1	1	...	...	...	...
Sudden (cause unascertained)...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Ill-defined .....	10	7	...	...	...	...	...	...	1	...	1	1	...	...
E.—Violent Deaths.														
1. ACCIDENT.														
In Mines and Quarries.....	1	...	...	...	...	...	...	1	...	...	...	...	...	...
By Vehicles { On Railways ...	8	...	...	...	...	...	1	2	5	...	...	...	...	...
{ In Streets.....	21	...	3	4	...	...	...	1	...	5	4	4	...	...
Ships, Boats, Docks (not Drowning) .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Building Operations .....	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Machinery .....	7	...	...	...	...	4	2	...	...	...	1	...	...	...
Weapons and Implements .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Burns and Scalds .....	70	5	38	10	2	1	2	2	...	2	2	6	...	...
Poison, Poisonous Vapours.....	13	...	...	...	1	2	2	2	5	...	1	...	...	...
Drowning .....	41	1	4	8	2	1	2	5	2	5	6	5	...	...
Suffocation.....	106	99	...	...	...	1	1	...	1	1	...	3	...	...
Falls .....	82	2	4	1	3	1	2	7	9	21	14	9	8	1
Weather Agencies.....	1	...	...	...	...	...	1	...	...	...	...	...	...	...
Otherwise or not Stated .....	20	...	...	1	1	1	1	4	3	4	3	1	1	...
2. HOMICIDE.														
	13	3	...	...	2	1	...	1	1	4	1	...	...	...
3. SUICIDE.														
	77	...	...	...	...	1	6	16	20	19	7	7	1	...
4. EXECUTION.														
	...	...	...	...	...	...	...	...	...	...	...	...	...	...



TABLE B.—MANCHESTER, 1905.

### CAUSES OF DEATHS AT DIFFERENT LIFE PERIODS—MALES.

Classes	CAUSES OF DEATH	All Ages  Total	AGES AT DEATH—IN YEARS													
			UNDER 5 YEARS		5	10	15	20	25	35	45	55	65	75	85	95 and upwards
			0 to 1	1 to 5	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	35 to 45	45 to 55	55 to 65	65 to 75	75 to 85		
	All Causes .....	5896	1650	677	148	71	111	129	338	488	675	706	586	275	42	
A	Smallpox .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Measles .....	121	33	85	2	...	1	...	...	...	...	...	...	...	...	
	Scarlet Fever .....	39	1	19	14	4	...	...	1	...	...	...	...	...	...	
	Typhus Fever.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Whooping Cough .....	92	42	48	2	...	...	...	...	...	...	...	...	...	...	
	Diphtheria, Memb: Croup .....	64	6	31	24	2	...	...	...	...	...	1	...	...	...	
	Ill-defined Fever.....	2	...	...	1	...	...	...	...	1	...	...	...	...	...	
	Enteric Fever .....	35	...	2	1	3	7	1	15	5	1	...	...	...	...	
	Influenza .....	53	3	2	...	...	1	...	2	4	12	10	14	4	1	
	Epidemic Diarrhoea .....	325	254	70	...	...	...	...	...	1	...	...	...	...	...	
	Diarrhoea, Dysen., Simple Chol.	71	53	11	1	...	...	...	...	1	2	...	2	1	...	
	Venereal Affections.....	34	16	3	...	...	...	...	...	2	4	7	2	...	...	
	Erysipelas .....	12	2	...	...	...	...	...	2	2	3	2	1	...	...	
	Pyæmia, Septicæmia .....	16	4	...	...	2	2	...	1	2	3	2	...	...	...	
	Puerperal Fever ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Other Zymotics .....	4	...	...	...	...	...	...	2	1	1	...	...	...	...	
	B and C	Tuberc. Periton: Tabes Mes: ...	33	15	9	5	1	1	...	...	...	1	1	...	...	...
		Tubercular Meningitis .....	78	21	37	14	3	...	...	1	1	1	...	...	...	...
		Phthisis.....	603	2	13	11	8	28	56	125	130	146	68	15	1	...
		Tuberculous Dis. (other) .....	77	24	13	7	3	6	1	10	6	3	2	2	...	...
Parasitic Diseases .....		...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Alcoholism .....		57	...	...	...	...	...	...	7	14	19	12	5	...	...	
Rheumatic Fever.....		21	...	...	2	5	1	2	2	7	1	...	1	...	...	
Cancer .....		238	1	...	2	...	3	1	10	19	62	75	52	12	1	
Premature Birth.....		237	237	...	...	...	...	...	...	...	...	...	...	...	...	
Congenital Defects.....		56	54	1	1	...	...	...	...	...	...	...	...	...	...	
Epilepsy .....		24	...	1	...	3	1	2	4	3	4	6	...	...	...	
Convulsions .....		108	99	7	1	...	1	...	...	...	...	...	...	...	...	
Nervous Syst: (other) .....		240	30	29	10	4	9	4	13	33	39	31	28	10	...	
Cereb: Haem: Apoplexy, Hemip:		175	...	...	...	...	...	...	2	16	29	51	46	27	4	
Heart and Blood Vessel Dis: ...		549	10	2	7	11	13	13	35	49	82	134	115	67	11	
B and C		Croup .....	2	...	2	...	...	...	...	...	...	...	...	...	...	...
		Bronchitis .....	514	125	49	1	...	2	1	7	22	51	98	98	53	7
		Pneumonia .....	658	159	132	18	3	15	17	40	70	80	57	54	13	...
		Respiratory Dis: (other) .....	77	2	9	2	...	2	2	6	12	18	10	9	5	...
B and C		Digestive Syst: (other) .....	239	99	17	2	5	3	6	11	18	26	30	15	7	...
	Urinary Syst: (other).....	152	2	4	1	1	...	2	6	20	31	41	36	7	1	
	Generative Organs .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
	Other specified Diseases .....	172	32	39	5	4	7	9	3	15	13	21	19	5	...	
D	Marasmus and Atrophy.....	313	272	17	...	1	...	...	...	...	...	3	7	10	3	
	Old Age .....	123	...	...	...	...	...	...	...	...	...	20	40	49	14	
	Other Ill-defined Causes .....	10	5	...	...	...	...	1	1	1	1	...	1	...	...	
E	Violence .....	207	46	25	14	6	7	8	20	20	24	17	17	3	...	
	Homicide .....	8	1	...	...	2	1	...	1	1	1	1	...	...	...	
	Suicide .....	57	...	...	...	...	...	3	11	14	15	6	7	1	...	



TABLE C.—MANCHESTER, 1905.

CAUSES OF DEATHS AT DIFFERENT LIFE PERIODS—FEMALES.

Classes	CAUSES OF DEATH	All Ages  Total	AGES AT DEATH—IN YEARS												
			UNDER 5 YEARS		5	10	15	20	25	35	45	55	65	75	85 and upwards
			0 to 1	1 to 5	to 10	to 15	to 20	to 25	to 35	to 45	to 55	to 65	to 75	to 85	
	All Causes .....	5362	1259	673	148	78	115	123	336	430	518	670	635	305	72
A	Smallpox .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Measles.....	110	20	85	4	...	1	...	...	...	...	...	...	...	...
	Scarlet Fever .....	39	...	21	15	2	...	...	...	1	...	...	...	...	...
	Typhus Fever .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Whooping Cough .....	103	41	59	3	...	...	...	...	...	...	...	...	...	...
	Diphtheria, Memb: Croup .....	63	1	42	17	2	1	...	...	...	...	...	...	...	...
	Ill-defined Fever.....	2	1	1	...	...	...	...	...	...	...	...	...	...	...
	Enteric Fever .....	20	...	1	2	...	3	...	11	2	...	...	1	...	...
	Influenza .....	42	...	3	...	1	2	2	5	3	6	7	9	4	...
	Epidemic Diarrhœa .....	275	215	52	1	...	...	...	...	...	...	2	4	1	...
	Diarrhœa, Dysentery, Simple														
	Cholera.....	58	42	8	...	...	...	1	...	1	...	1	4	...	1
	Venereal Affections.....	20	17	1	...	...	...	1	...	1	...	...	...	...	...
	Erysipelas.....	12	3	...	...	...	...	1	1	4	1	1	...	...	1
	Pyæmia, Septicæmia .....	8	...	...	...	1	...	...	2	4	...	1	...	...	...
	Puerperal Fever .....	20	...	...	...	...	...	7	9	4	...	...	...	...	...
	Other Zymotics .....	10	1	3	...	1	1	...	3	...	1	...	...	...	...
	Tubercular Periton : Tabes Mes.	41	25	7	4	1	1	...	1	1	1	...	...	...	...
	Tubercular Meningitis .....	73	19	38	9	4	1	...	2	...	...	...	...	...	...
	Phthisis .....	385	3	8	14	12	38	39	88	91	53	31	7	...	1
	Tuberculous Diseases (other) ...	72	14	20	11	6	1	1	11	3	3	...	2	...	...
B and C	Parasitic Diseases .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Alcoholism .....	27	...	...	...	...	...	...	3	9	9	5	1	...	...
	Rheumatic Fever .....	14	...	...	1	5	2	...	1	2	3	...	...	...	...
	Cancer .....	308	...	...	...	...	2	...	11	50	74	91	66	14	...
	Premature Birth .....	177	177	...	...	...	...	...	...	...	...	...	...	...	...
	Congenital defects .....	47	44	3	...	...	...	...	...	...	...	...	...	...	...
	Epilepsy .....	28	1	1	3	...	...	1	5	8	3	3	1	2	...
	Convulsions .....	77	62	12	2	...	1	...	...	...	...	...	...	...	...
	Nervous System (other) .....	193	16	23	10	7	7	4	17	22	30	27	17	10	3
	Cerebral Hemorrhage, Apoplexy, and Hemiplegia .....	244	1	1	1	...	...	...	2	17	48	62	80	30	2
	Heart and Blood Vessel Diseases	595	7	4	6	10	14	19	34	65	85	135	127	71	18
	Croup .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bronchitis .....	507	86	38	3	...	4	2	4	23	49	116	115	54	13
	Pneumonia .....	509	92	138	15	6	8	8	38	40	46	62	38	16	2
	Respiratory Diseases (other).....	70	8	11	4	2	2	1	4	4	9	8	8	8	1
	Digestive System (other) .....	274	76	22	7	7	7	15	25	20	26	38	25	5	1
	Urinary System (other).....	110	2	5	2	2	7	4	15	11	22	20	15	4	1
	Generative Organs and Childbirth	59	...	...	...	...	2	3	22	23	5	2	1	1	...
	Other specified Diseases .....	177	42	31	4	6	5	5	12	9	17	20	20	5	1
D	Marasmus and Atrophy.....	230	176	11	...	...	...	...	...	...	...	4	20	13	6
	Old Age .....	155	...	...	...	...	...	...	...	...	1	14	60	60	20
	Other Ill-defined Causes .....	19	4	...	...	...	...	1	1	4	1	5	2	1	...
E	Violence .....	164	61	24	10	3	4	6	4	5	15	14	11	6	1
	Homicide .....	5	2	...	...	...	...	...	...	...	3	...	...	...	...
	Suicide .....	20	...	...	...	...	1	3	5	6	4	1	...	...	...

TABLE D.  
CITY OF MANCHESTER, 1905.—CAUSES OF DEATH IN INFANCY AND  
CHILDHOOD.

CAUSES OF DEATH	UNDER ONE YEAR			Total under One Year	ONE AND UNDER FIVE YEARS				Total under Five Years
	Under 3 months	3-6 months	6-12 months		1-	2-	3-	4-	
All Causes .....	1,437	624	848	2,909	776	291	170	113	4,259
Measles . . . . .	1	2	50	53	98	42	17	13	223
Scarlatina . . . . .	...	...	1	1	7	13	10	10	41
Whooping Cough . . . . .	10	23	50	83	63	22	17	5	190
Diphtheria..... (Memb: Croup)	...	1	6	7	18	18	22	15	80
Fever (various forms) .....	...	...	1	1	1	1	2	...	5
Diarrhoeal Diseases .....	144	192	228	564	123	9	7	2	705
Syphilis .....	21	10	2	33	3	1	...	...	37
Tabes Mesenterica and Tuberc. Peritonitis	11	15	14	40	7	3	5	1	56
Hydrocephalus .....	2	9	29	40	32	21	14	8	115
Scrofula (other).....	13	11	19	43	28	9	8	9	97
Premature Birth .....	408	6	...	414	...	...	...	...	414
Teething .....	...	2	25	27	20	2	...	...	49
Convulsions .....	103	32	26	161	12	3	2	2	180
Brain Diseases (other) .....	7	11	29	47	29	9	9	7	101
Lung Diseases .....	117	107	248	472	238	84	36	21	851
Atrophy, Marasmus .....	300	104	44	448	23	4	1	...	476
Found Dead in Bed (over- laid)	68	19	2	89	...	...	...	...	89
Suffocation .....	8	1	1	10	...	...	...	...	10
Violence (other forms) .....	5	1	5	11	11	20	7	11	60
Ill-defined Causes.....	8	...	1	9	...	...	...	...	9
Unclassified .....	211	78	67	356	63	30	13	9	471



TABLE E, 1881 TO 1905.—MANCHESTER.—ESTIMATED POPULATIONS. ANNUAL RATES OF MARRIAGES, BIRTHS, AND DEATHS  
*(a)* from all causes, and *(b)* from specified causes ; also the percentages to total deaths of Inquest Cases, and of Deaths in Public Institutions ; also the quinquennial averages from 1871-1905, with the average for same period.

YEARS	Estimated Populations — (Mean)	Persons Married	ANNUAL RATES PER 1,000 PERSONS LIVING												PERCENTAGES TO TOTAL DEATHS			YEARS
			Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhoea and Dysentery	English Cholera	Violence	Inquest Cases	Deaths in Public Institutions	
Quinquennial Averages	1871-1875	24.6	38.9	28.3	0.26	0.64	1.08	0.08	0.78	0.14	0.43	0.21	1.92	0.03	0.94	7.2	13.4	1871-1875
	1876-1880	18.6	38.7	26.2	0.24	0.53	1.07	0.13	0.84	0.08	0.29	0.11	1.22	0.04	0.89	7.5	14.3	1876-1880
	1881-1885	17.9	35.1	23.6	0.04	0.71	0.48	0.10	0.68	0.05	0.20	0.03	0.96	0.03	0.72	7.0	15.9	1881-1885
	1886-1890	16.6	33.4	24.6	0.02	0.83	0.50	0.32	0.54	0.02	0.30	0.01	1.06	0.02	0.78	6.9	17.7	1886-1890
	1891-1895	16.9	33.2	23.6	0.03	0.62	0.26	0.27	0.64	0.00	0.24	0.01	1.14	0.05	0.77	7.1	19.2	1891-1895
	1896-1900	18.2	32.5	22.7	...	0.89	0.20	0.13	0.53	0.00	0.18	0.01	1.65	0.04	0.73	7.1	20.2	1896-1900
	1901-1905	17.4	30.9	20.14	0.10	0.55	0.19	0.22	0.41	0.00	0.13	0.00	1.15		0.72	7.1	24.4	1901-1905
Ave. 35 yrs.			35.3	24.8	0.10	0.70	0.60	0.17	0.67	0.05	0.27	0.06	1.32	0.03	0.80	7.1	16.8	1871-1905 Ave. 35 yrs.
1881	530,051	17.8	35.9	22.8	0.03	0.29	0.34	0.09	0.71	0.03	0.17	0.06	0.73	0.02	0.84	8.1	15.9	1881
1882	536,324	18.8	35.7	24.0	0.05	0.89	0.34	0.11	0.87	0.10	0.25	0.04	1.00	0.03	0.67	7.2	14.5	1882



TABLE E—Continued.

YEARS	Estimated Populations — (Mean)	Person Married	ANNUAL RATES PER 1,000 PERSONS LIVING												PERCENTAGES TO TOTAL DEATHS		YEARS	
			Births	Deaths (All Causes)	Smallpox	Measles	Scarlet Fever	Diphtheria	Whooping Cough	Typhus Fever	Enteric Fever	Simple Continued Fever	Diarrhoea and Dysentery	English Cholera	Violence	Inquest Cases		Deaths in Public Institutions
1883	542,671	17.8	34.9	24.4	0.01	0.71	0.81	0.11	0.62	0.05	0.20	0.03	0.95	0.03	0.73	7.0	15.5	1883
1884*	549,093	18.0	34.4	23.4	0.01	0.57	0.74	0.08	0.49	0.03	0.19	0.03	1.46	0.05	0.65	6.2	17.3	1884*
1885	555,591	17.0	34.8	23.6	0.08	1.08	0.17	0.10	0.71	0.04	0.17	0.01	0.64	0.02	0.69	6.4	16.4	1885
1886	562,166	16.4	34.7	24.1	0.00	0.27	0.41	0.15	0.57	0.03	0.29	0.01	1.34	0.04	0.71	7.2	17.0	1886
1887	568,819	16.6	33.9	25.4	0.01	1.54	0.63	0.23	0.50	0.02	0.31	0.01	1.19	0.02	0.77	6.9	16.1	1887
1888	575,550	16.0	33.3	23.3	0.07	0.27	0.42	0.36	0.79	0.02	0.33	0.02	0.71	0.01	0.74	6.7	18.3	1888
1889	582,362	17.0	33.1	24.2	0.00	1.22	0.45	0.51	0.45	0.01	0.31	0.01	1.00	0.03	0.89	6.5	18.2	1889
1890*	589,253	17.0	31.8	26.2	...	0.83	0.60	0.36	0.37	0.01	0.27	0.02	1.04	0.02	0.79	7.0	19.1	1890*
1891†	† 508,673	17.2	33.8	26.0	...	0.43	0.22	0.25	1.02	0.01	0.37	0.01	0.81	0.04	0.79	6.8	18.4	1891†
1892†	† 513,196	17.2	33.4	23.2	0.00	0.72	0.27	0.25	0.72	0.00	0.24	0.01	0.79	0.02	0.77	7.4	18.2	1892†
1893†	† 517,760	16.0	33.4	24.3	0.09	0.57	0.27	0.35	0.46	0.00	0.25	0.01	1.75	0.10	0.76	6.9	18.7	1893†
1894†	† 522,365	16.8	31.8	19.8	0.04	0.42	0.22	0.29	0.55	...	0.17	0.01	0.70	0.02	0.75	7.5	21.3	1894†
1895†	† 527,010	17.4	33.4	24.5	0.00	0.96	0.33	0.21	0.47	...	0.18	0.01	1.66	0.06	0.80	6.9	19.2	1895†
1896†*	† 531,697	18.3	32.8	22.0	...	1.05	0.37	0.15	0.66	0.00	0.22	0.01	1.04	0.02	0.71	7.4	19.7	1896†*
1897†	† 536,426	17.8	32.9	22.4	...	1.17	0.23	0.08	0.56	0.00	0.18	0.00	1.74	0.06	0.68	6.6	20.0	1897†
1898†	† 541,296	18.3	32.3	21.2	...	0.50	0.12	0.09	0.31	...	0.22	0.01	1.96	0.06	0.69	7.0	19.5	1898†
1899†	† 546,010	18.4	32.2	23.9	...	1.28	0.08	0.16	0.42	0.00	0.13	0.01	2.02	0.03	0.78	7.0	19.7	1899†
1900†	† 542,566	18.0	32.4	23.8	...	0.47	0.19	0.19	0.68	...	0.14	0.01	1.49	0.03	0.78	7.4	21.9	1900†
1901†	† 546,408	17.6	28.7	21.6	...	0.53	0.23	0.24	0.41	0.02	0.14	0.00	1.86	...	0.78	7.9	23.2	1901†
1902†*	† 550,355	18.1	33.0	20.0	...	0.44	0.27	0.22	0.44	...	0.12	...	0.54	...	0.73	7.6	23.8	1902†*
1903†	† 554,331	17.8	31.7	19.5	0.04	0.62	0.17	0.25	0.38	...	0.17	0.00	0.91	...	0.72	7.0	25.3	1903†
1904†	† 558,335	16.5	31.1	20.9	0.02	0.76	0.15	0.18	0.50	...	0.12	0.00	1.36	...	0.73	5.9	24.6	1904†
1905§	† 631,933	17.0	29.0	17.8	...	0.37	0.12	0.20	0.31	...	0.09	0.01	1.15	...	0.59	6.7	24.1	1905§
1905	562,346	...	30.1	18.7	...	0.40	0.13	0.22	0.34	...	0.09	0.01	1.27	...	0.65	6.9	24.9	1905

\* The facts for these years are for 53 instead of 52 weeks; corrections have, therefore, been made in calculating the rates.  
† The populations and rates for the years subsequent to 1890, except the marriage rates, relate to the City of Manchester as enlarged by the Act of that year. The facts and rates for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."  
‡ These figures include a proportion of the inmates of certain Extra-municipal Institutions which receive patients from the City of Manchester, and are therefore in excess of the estimates of the Registrar-General.  
§ Includes the newly amalgamated districts of Moss Side and Withington. || Excluding of Moss Side and Withington.

TABLE F, 1881 TO 1905.—MANCHESTER.

ANNUAL RATES OF MORTALITY FROM CERTAIN CAUSES OF DEATH.

YEAR	ANNUAL RATES PER 1,000 PERSONS LIVING										RATES PER 1,000 BIRTHS	
	Cancer	Tabes Mesenterica	Phthisis	Other Tubercular Diseases	Diseases of Nervous System	Diseases of Circulatory System	Diseases of Respiratory System	Diseases of Digestive System	Diseases of Urinary System	Diseases of Generative System	Puerperal Fever	Childbirth
1881-1885	0.50	0.35	2.42	0.57	3.28	1.37	5.41	1.23	0.48	0.08	3.03	1.99
1886-1890	0.64	0.36	2.24	0.59	3.09	1.73	5.76	1.23	0.61	0.08	3.22	2.13
1891-1895	0.62	0.22	2.09	0.75	1.74	2.53	5.56	1.07	0.52	0.07	2.75	3.42
1896-1900	0.73	0.19	2.04	0.63	1.32	2.54	5.03	1.04	0.49	0.09	1.55	1.51
1901-1905	0.80	0.16	1.94	0.55	1.17	2.56	4.29	0.95	0.49	0.08	1.21	1.76
1881-1905	0.66	0.26	2.15	0.62	2.12	2.15	5.21	1.10	0.52	0.08	2.35	2.16
1881	0.48	0.28	2.46	0.52	3.33	1.19	5.57	1.24	0.39	0.07	3.15	1.37
1882	0.44	0.40	2.41	0.61	3.35	1.34	5.33	1.19	0.45	0.08	3.92	1.62
1883	0.54	0.34	2.54	0.59	3.32	1.33	5.66	1.20	0.50	0.06	2.27	1.58
1884*	0.51	0.39	2.34	0.56	3.27	1.44	4.88	1.23	0.59	0.10	2.81	2.55
1885	0.51	0.36	2.34	0.56	3.12	1.53	5.59	1.28	0.49	0.08	3.05	2.84
1886	0.56	0.43	2.44	0.59	3.30	1.53	5.43	1.26	0.57	0.08	2.67	1.85
1887	0.62	0.39	2.19	0.53	3.17	1.66	5.72	1.23	0.53	0.08	3.58	1.35
1888	0.65	0.31	2.14	0.62	3.19	1.72	5.31	1.16	0.62	0.10	4.12	1.77
1889	0.70	0.36	2.12	0.59	2.94	1.79	5.06	1.28	0.64	0.08	3.06	1.87
1890*	0.65	0.33	2.33	0.62	2.87	1.93	7.28	1.22	0.66	0.08	2.68	3.89
1891†	0.63	0.25	2.20	0.78	2.30	2.69	6.77	1.03	0.55	0.07	3.08	4.01
1892†	0.61	0.21	2.05	0.75	1.70	2.59	5.44	1.14	0.53	0.05	3.79	4.54
1893†	0.59	0.26	2.05	0.76	1.70	2.48	5.53	1.20	0.53	0.07	3.70	3.94
1894†	0.66	0.18	1.97	0.67	1.48	2.31	4.35	0.96	0.49	0.04	1.93	2.77
1895†	0.63	0.22	2.16	0.77	1.51	2.60	5.73	1.04	0.49	0.11	1.25	1.82
*1896†	0.66	0.13	2.00	0.60	1.33	2.53	5.19	1.04	0.46	0.11	0.96	1.47
1897†	0.74	0.22	2.12	0.67	1.35	2.45	4.51	1.03	0.51	0.10	2.10	1.36
1898†	0.73	0.19	1.95	0.67	1.22	2.15	4.27	1.00	0.54	0.09	1.72	1.54
1899†	0.75	0.24	2.05	0.61	1.34	2.73	5.47	0.99	0.47	0.10	1.37	1.54
1900†	0.76	0.17	2.09	0.60	1.37	2.82	5.78	1.15	0.48	0.05	1.59	1.65
1901†	0.78	0.20	2.09	0.83	1.22	2.55	4.48	1.00	0.49	0.03	2.17	1.72
*1902†	0.79	0.16	2.08	0.55	1.13	2.61	4.71	0.93	0.58	0.11	0.94	1.65
1903†	0.76	0.18	1.85	0.58	1.25	2.46	3.95	0.99	0.46	0.08	0.80	1.59
1904†	0.81	0.15	1.98	0.54	0.76†	2.71	4.38	1.02	0.50	0.09	1.04	2.13
1905†	0.86	0.12	1.56	0.48	1.06	2.47	3.70	0.81	0.41	0.09	1.09	1.80
1905§	0.86	0.13	1.68	0.50	1.10	2.49	3.94	0.83	0.42	0.10	1.12	1.71

\* The facts for these years are for 53 instead of 52 weeks; corrections have therefore been made in calculating the rates.

† The rates of mortality for the years subsequent to 1890 refer to the City of Manchester as enlarged by the Act of that year. The rates for 1890 and for previous years are those for the three Unions of Manchester, Chorlton, and Prestwich, which have been taken to approximately represent "Manchester."

‡ 1.17, including Convulsions.

|| Includes the newly amalgamated districts of Moss Side and Withington.

§ Exclusive of Moss Side and Withington.



TABLE G, 1905.—POPULATION, AREA, DENSITY. TOTAL BIRTHS AND DEATHS,  
WITH BIRTH AND DEATH RATES.

[INSTITUTION POPULATIONS, BIRTHS AND DEATHS, DISTRIBUTED.]

STATISTICAL DIVISIONS	Estimated Population	Area in Acres	Persons to an Acre	BIRTHS		DEATHS		Natura Rate of Increas
				Total	Rate per 1,000	Total	Rate per 1,000	
City of Manchester.....	631,933	19,059	33	18,325	29'00	11,258	17'82	11'18
I. Manchester Township..	129,452	1,646	79	4,149	32'05	3,157	24'39	7'66
II. North Manchester .....	182,193	7,321	25	5,332	29'27	2,713	14'89	14'38
III. South Manchester .....	320,288	10,092	32	8,844	27'61	5,388	16'82	10'79
I. { Ancoats .....	43,881	400	110	1,514	34'50	1,093	24'91	9'59
{ Central .....	27,092	748	36	764	28'20	691	25'51	2'69
{ St. George's.....	58,479	498	117	1,871	31'99	1,373	23'48	8'51
II. { Cheetham .....	40,281	919	44	1,171	29'07	475	11'79	17'28
{ Crumpsall .....	9,224	733	13	209	22'66	109	11'82	10'84
{ Blackley .....	9,445	1,840	5	265	28'06	160	16'94	11'12
{ Harpurhey .....	19,886	193	103	507	25'50	254	12'77	12'73
{ Moston .....	16,622	1,297	13	359	21'60	197	11'85	9'75
{ Newton Heath .....	38,157	1,350	28	1,109	29'06	611	16'01	13'05
{ Bradford .....	24,786	288	86	923	37'24	507	20'46	16'78
{ Beswick .....	12,256	96	128	440	35'90	220	17'95	17'95
{ Clayton .....	11,536	605	19	349	30'25	180	15'60	14'65
III. { Ardwick .....	43,715	509	86	1,288	29'46	733	16'77	12'69
{ Openshaw .....	28,367	581	49	1,004	35'39	515	18'15	17'24
{ West Gorton .....	31,126	318	98	911	29'27	530	17'03	12'24
{ Rusholme and Kirk. ...	26,021	1,412	18	765	29'40	374	14'37	15'03
{ Chorlton-upon-Medlock	56,716	646	88	1,342	23'66	1,106	19'50	4'16
{ Hulme.....	64,757	477	136	2,153	33'25	1,409	21'76	11'49
{ Moss Side .....	27,884	421	66	578	20'73	335	12'01	8'72
{ Withington .....	41,703	5,728	7	803	19'26	386	9'26	10'00

NOTE.—Calculated on the Census of 1891 and 1901.



TABLE H, 1905.

BIRTHS REGISTERED IN THE CITY OF MANCHESTER, IN ITS MAIN DIVISIONS  
AND IN DISTRICTS; DISTINGUISHING LEGITIMATE AND ILLEGITIMATE BIRTHS;  
ALSO THE PROPORTION OF MORTALITY AMONG INFANTS OF BOTH CLASSES UNDER  
ONE YEAR OF AGE.

STATISTICAL DIVISIONS	BIRTHS		Percentage of Illegitimate Births to Total Births	DEATHS UNDER 1 YEAR		PROPORTION OF DEATHS UNDER 1 YEAR PER 1,000 BIRTHS		
	Total	Illegitimate		Total	Of Illegitimate Children	Total	Legitimate	Illegitimate
City of Manchester.....	18,325	690	3·8	2,909	223	159	152	323
I. Manchester Township	4,149	188	4·5	814	75	196	187	399
II. North Manchester... ..	5,332	135	2·5	766	45	144	139	333
III. South Manchester .....	8,844	367	4·2	1,329	103	150	145	281
I. { Ancoats .....	1,514	56	3·7	287	17	190	185	304
{ Central .....	764	55	7·2	166	28	217	195	509
{ St. George's .....	1,871	77	4·1	361	30	193	185	390
II. { Cheetham .....	1,171	30	2·6	128	8	109	105	266
{ Crumpsall .....	209	9	4·3	30	3	144	135	333
{ Blackley.....	265	4	1·5	29	0	109	111	...
{ Harpurhey.....	507	15	3·0	73	2	144	144	133
{ Moston .....	359	8	2·2	40	1	111	111	125
{ Newton Heath .....	1,109	29	2·6	158	10	142	137	345
{ Bradford .....	923	23	2·5	166	11	180	172	478
{ Beswick .....	440	11	2·5	70	6	159	149	545
{ Clayton .....	349	6	1·7	72	4	206	198	666
III. { Ardwick .....	1,288	52	4·0	197	18	153	145	346
{ Openshaw .....	1,004	27	2·7	164	8	163	160	296
{ Gorton (West) .....	911	24	2·6	152	15	167	154	625
{ Rusholme and Kirk.	765	33	4·3	74	6	97	93	182
{ Chorlton-on-Medlock	1,342	98	7·3	256	28	191	183	286
{ Hulme .....	2,153	94	4·4	363	22	169	166	234
{ Moss Side .....	578	19	3·3	58	5	100	95	263
{ Withington.....	803	20	2·5	65	1	81	82	50

TABLE J, 1905.

INFANTILE MORTALITY IN THE CITY, AND ITS THREE MAIN  
DIVISIONS.

DEATH-RATES UNDER ONE YEAR PER 1,000 BIRTHS.

CAUSES OF DEATH	City of Manchester	Manchester Township	North Manchester	South Manchester
All Causes .....	158·74	196·19	143·66	150·27
Measles .....	2·89	4·10	3·00	2·26
Whooping Cough .....	4·53	3·37	4·13	5·31
Other Com: Infectious Diseases†	0·49	0·48	0·56	0·45
Diarrhoeal Diseases .....	30·78	47·72	31·32	22·50
Tubercular Diseases‡	6·71	5·54	4·13	8·82
Convulsions .....	8·79	8·68	8·06	9·27
Other Nervous Diseases§	2·56	2·17	3·00	2·49
Lung Diseases .....	25·76	33·02	23·44	23·74
Wasting Diseases   .....	47·04	51·82	46·32	45·23
Suffocation .....	0·55	1·21	.....	0·57
Found dead in bed ....	4·86	6·99	3·19	4·86

† These are Smallpox, Scarlatina, Diphtheria, Membranous Croup, and various forms of “Fever,” including the chief forms of Typhus and Typhoid.

‡ These are Phthisis, Tubercular Meningitis (Hydrocephalus), Tabes Mesenterica, and General Tuberculosis (Scrofula).

§ These are Meningitis, and other diseases of the Brain and Spinal Cord.

|| These are Premature Birth, and such ill-defined causes as Atrophy, Marasmus, Debility, Inanition, &c.

TABLE K, 1905.—CITY OF MANCHESTER. ANNUAL RATES OF MORTALITY PER 1,000 PERSONS LIVING AT ALL AGES, IN THE CITY OF MANCHESTER AND IN ITS STATISTICAL DIVISIONS, FROM CERTAIN DISEASES AND GROUPS OF DISEASES.

CAUSES OF DEATH	City of Manchester	City—exclusive of Moss Side and Withington	Manchester Township	North Manchester	South Manchester	South—exclu- sive of Moss Side and Withington	City of Manchester Average of 10 years 1895-1904
All Causes .....	17·82	18·74	24·39	14·89	16·82	18·62	21·97
Smallpox .....	...	...	...	...	...	...	0·01
Measles .....	0·37	0·40	0·64	0·39	0·24	0·28	0·78
Scarlet Fever .....	0·12	0·13	0·15	0·10	0·12	0·15	0·21
Typhus Fever .....	...	...	...	...	...	...	0·00
Influenza .....	0·15	0·15	0·23	0·11	0·14	0·14	0·22
Whooping Cough .....	0·31	0·34	0·30	0·27	0·33	0·40	0·48
Diphtheria, and Memb: Croup	0·20	0·22	0·25	0·19	0·19	0·22	0·18
Ill-defined Fever.....	0·01	0·01	0·01	...	0·01	0·01	0·01
Enteric Fever .....	0·09	0·09	0·12	0·07	0·08	0·09	0·16
Diarrhoeal Diseases .....	1·15	1·27	2·09	1·14	0·79	0·94	1·48
Puerperal Fever .....	0·03	0·03	0·02	0·03	0·04	0·04	0·04
Erysipelas .....	0·04	0·04	0·03	0·04	0·04	0·05	0·05
Pyæmia, Septicæmia .....	0·04	0·04	0·07	0·02	0·04	0·04	0·03
Phthisis (Tuberc: Pulmon:) ...	1·56	1·68	3·00	0·96	1·33	1·53	2·04
Tubercular Meningitis.....	0·24	0·25	0·25	0·16	0·27	0·32	0·28
Tuberc: Periton: Tabes Mes:..	0·12	0·13	0·08	0·07	0·16	0·19	0·19
Tuberculous Dis: (other) .....	0·24	0·25	0·36	0·19	0·22	0·24	0·37
Alcoholism .....	0·13	0·15	0·25	0·05	0·13	0·16	0·12
Cancer .....	0·86	0·86	0·90	0·74	0·92	0·92	0·74
Rheumatic Fever .....	0·06	0·06	0·06	0·07	0·05	0·05	0·07
Premature Birth .....	0·66	0·69	0·63	0·65	0·67	0·76	0·64
Nervous Diseases .....	1·06	1·10	1·33	0·94	1·02	1·09	1·29
Heart and Blood Vessels Diseases	2·47	2·49	2·48	2·04	2·72	2·82	2·56
Bronchitis .....	1·62	1·75	2·36	1·50	1·38	1·61	2·17
Pneumonia .....	1·85	1·96	2·67	1·37	1·77	2·03	2·39
Respiratory Diseases (other) ...	0·23	0·23	0·25	0·21	0·24	0·25	0·30
Digestive Organs (Diseases of)	0·81	0·83	1·03	0·67	0·81	0·85	1·02
Urinary Organs (Diseases of)	0·41	0·42	0·39	0·32	0·48	0·51	0·50
Old Age .....	0·44	0·45	0·87	0·32	0·33	0·32	0·42



TABLE I., 1905.

MANCHESTER.—CERTIFICATION OF THE CAUSES OF DEATH IN THE MAIN  
DIVISIONS AND IN DISTRICTS.

STATISTICAL DIVISIONS.	Total Deaths	Certified by		Not Certified	Proportion per cent. of Deaths		
		Registered Medical Practitioners	Coroner		Certified by		Not Certified
					Regist'd Medical Practitioners	Coroner	
City of Manchester .....	11,258	10,317	755	186	91·6	6·7	1·7
I. Manchester Township ...	3,157	2,831	262	64	89·7	8·3	2·0
II. North Manchester .....	2,713	2,506	167	40	92·3	6·2	1·5
III. South Manchester .....	5,388	4,980	326	82	92·4	6·1	1·5
I. { Ancoats .....	1,093	979	91	23	89·6	8·3	2·1
{ Central .....	691	607	68	16	87·9	9·8	2·3
{ St. George's .....	1,373	1,245	103	25	90·7	7·5	1·8
II. { Cheetham .....	475	430	36	9	90·5	7·6	1·9
{ Crumpsall ..	109	101	3	5	92·6	2·8	4·6
{ Blackley .....	160	151	5	4	94·4	3·1	2·5
{ Harpurhey .....	254	238	13	3	93·7	5·1	1·2
{ Moston .....	197	182	13	2	92·4	6·6	1·0
{ Newton Heath .....	611	564	40	7	92·3	6·6	1·1
{ Bradford .....	507	474	29	4	93·5	5·7	0·8
{ Beswick .....	220	201	16	3	91·3	7·3	1·4
{ Clayton .....	180	165	12	3	91·6	6·7	1·7
III. { Ardwick .....	733	681	39	13	92·9	5·3	1·8
{ Openshaw .....	515	487	25	3	94·5	4·9	0·6
{ Gorton (West) .....	530	485	38	7	91·5	7·2	1·3
{ Rusholme and Kirk. ...	374	354	18	2	94·7	4·8	0·5
{ Chorlton-upon-Medlock	1,106	1,000	86	20	90·4	7·8	1·8
{ Hulme .....	1,409	1,289	91	29	91·4	6·5	2·1
{ Moss Side .....	335	318	12	5	94·9	3·6	1·5
{ Withington .....	386	366	17	3	94·8	4·4	0·8

TABLE M, 1905—CITY OF MANCHESTER.—ANNUAL RATES OF MORTALITY AT SIX GROUPS OF AGES, \* PER 1,000 LIVING AT

THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH	Under 5 Years	5 to 14 Years	15 to 24 Years	25 to 44 Years	45 to 64 Years	65 Years and upwards
All Causes.....	59·18	3·51	3·65	8·24	28·57	99·38
Smallpox.....	...	...	...	...	...	...
Measles .....	3·10	0·05	0·02	...	...	...
Scarlatina .....	0·57	0·28	...	0·01	...	...
Diphtheria, Memb. Croup.....	1·11	0·36	0·01	...	0·01	...
Whooping Cough.....	2·64	0·04	...	...	...	...
{ Typhus .....	...	...	...	...	...	...
Fever .....	0·04	0·05	0·08	0·17	0·01	0·05
{ Enteric.....	0·03	0·01	...	...	0·01	...
{ Continued.....						
Diarrhoeal Diseases.....	9·80	0·02	0·01	0·01	0·07	0·67
Tubercular Diseases .....	3·72	0·89	1·32	2·43	3·45	1·45
Malignant Disease.....	0·01	0·02	0·05	0·47	3·36	7·53
{ Nervous System.....	3·91	0·32	0·23	0·54	1·59	3·68
{ Heart and Blood Vessels.....	0·35	0·28	0·45	1·14	6·96	31·03
Diseases of ...	11·83	0·43	0·49	1·40	6·72	25·64
{ Respiratory System.....	2·97	0·17	0·24	0·38	1·33	2·75
{ Digestive System.....	0·18	0·05	0·10	0·27	1·27	3·32
{ Urinary System.....						
Other Diseases.....	18·93	0·58	0·66	1·42	3·79	23·25

\* For death-rates at all ages, see Table K.

TABLE N, 1905.—ANNUAL RATES OF MORTALITY IN STATISTICAL DIVISIONS AT SIX GROUPS OF AGES, \* PER 1,000 LIVING AT THOSE AGE GROUPS, FROM CERTAIN PREVALENT DISEASES, AND GROUPS OF DISEASES.

CAUSES OF DEATH	Under 5 Years			5 to 14 Years			15 to 24 Years		
	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester
All Causes .....	83·02	48·79	55·41	4·40	3·04	3·43	4·30	3·64	3·40
Smallpox.....	...	...	...	...	...	...	...	...	...
Measles .....	5·18	3·07	2·19	0·11	0·05	0·02	0·04	...	0·02
Scarlatina .....	0·85	0·36	0·58	0·23	0·28	0·30	...	...	...
Diphtheria, Memb. Croup .....	1·51	0·89	1·08	0·34	0·35	0·36	...	...	0·02
Whooping Cough .....	2·56	2·18	2·98	...	0·03	0·07	...	...	...
Fever .....	Typhus .....	...	...	...	...	...	...	...	...
	Enteric .....	0·07	0·06	0·08	...	0·07	0·08	0·16	0·05
	Continued .....	0·07	0·03	...	...	0·02	...	...	...
Diarrhoeal Diseases .....	17·33	8·74	7·13	...	0·03	0·02	0·04	...	...
Tubercular Diseases.....	3·81	2·27	4·65	1·33	0·48	0·97	1·71	1·20	1·24
Malignant Disease.....	...	...	0·03	0·04	0·03	...	...	0·03	0·08
Diseases of	Nervous System ...	4·27	3·64	3·92	0·38	0·33	0·28	0·27	0·10
	Heart & Blood Vess:	0·33	0·27	0·41	0·49	0·28	0·18	0·34	0·55
	Respiratory System.	17·78	9·91	10·43	0·49	0·48	0·36	0·80	0·47
	Digestive System ...	4·59	1·96	2·92	0·23	0·15	0·15	0·19	0·24
	Urinary System.....	0·13	0·13	0·23	0·04	0·05	0·05	...	0·21
Other Diseases .....	24·54	15·37	18·76	0·65	0·51	0·61	0·84	0·68	0·59

CAUSES OF DEATH	25 to 44 Years			45 to 64 Years			65 Years and upwards		
	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester	Manchester Township	North Manchester	South Manchester
All Causes .....	12·47	6·53	7·56	38·76	23·96	26·65	107·98	95·41	97·84
Smallpox.....	...	...	...	...	...	...	...	...	...
Measles .....	...	...	...	...	...	...	...	...	...
Scarlatina .....	...	...	0·02	...	...	...	...	...	...
Diphtheria, Memb. Croup .....	...	...	...	...	...	0·02	...	...	...
Whooping Cough .....	...	...	...	...	...	...	...	...	...
Fever .....	Typhus .....	...	...	...	...	...	...	...	...
	Enteric .....	0·24	0·11	0·18	0·05	...	...	0·21	...
	Continued .....	...	...	...	...	0·02	...	...	...
Diarrhoeal Diseases .....	0·03	0·02	...	0·15	0·13	...	0·25	1·07	0·66
Tubercular Diseases.....	4·82	1·66	1·94	7·37	1·73	2·68	3·23	1·07	0·95
Malignant Disease.....	0·66	0·41	0·43	3·40	3·28	3·38	6·21	7·26	8·15
Diseases of	Nervous System ..	0·84	0·50	0·46	2·11	1·21	1·56	4·22	3·63
	Heart & Blood Vess:	1·31	0·98	1·16	7·68	6·30	6·99	23·60	28·82
	Respiratory System.	1·81	1·07	1·42	9·48	6·26	5·81	31·04	20·70
	Digestive System ...	0·42	0·37	0·38	1·49	1·34	1·27	1·74	2·56
	Urinary System .....	0·29	0·18	0·31	1·29	0·65	1·56	2·73	4·48
Other Diseases .....	2·07	1·24	1·27	5·72	3·07	3·36	35·02	25·61	17·71

\* For death-rates at all ages, see Table K.



TABLE O, 1905.—PARTICULARS AS TO MANCHESTER PATIENTS UNDER TREATMENT IN THE SEVERAL FEVER HOSPITALS DURING THE YEAR ; ALSO OF PATIENTS FROM OUTSIDE DISTRICTS SENT TO MONSALL AND CLAYTON DURING THE SAME PERIOD.

DISEASE	HOSPITAL	In Hospital commence- ment of year	Admitted	Discharged	Died	Remaining in Hospital close of year
SMALLPOX .....	Clayton Hospital .....	4	6	10	...	...
	Total .....	4	6	10	...	...
SCARLET FEVER ...	Monsall .....	320	1,357	1,413	50	214
	Baguley Sanatorium...	19	125	94	3	47
	Other Hospitals.....	...	1	...	...	1
	Total .....	339	1,483	1,507	53	262
DIPHThERIA .....	Monsall .....	50	309	277	61	21
	Baguley Sanatorium ..	1	18	10	1	8
	Other Hospitals .....	...	1	...	1	...
	Total .....	51	328	287	63	29
ENTERIC FEVER...	Monsall .....	26	204	175	29	26
	Baguley Sanatorium...	...	3	2	1	...
	Other Hospitals .....	6	45	28	10	13
	Total .....	32	252	205	40	39
TYPHUS FEVER ...	Monsall .....	...	...	...	...	...
	Baguley Sanatorium...	...	...	...	...	...
	Other Hospitals .....	...	...	...	...	...
	Total .....	...	...	...	...	..
OTHER ACUTE DISEASES .....	Monsall .....	23	224	200	33	14
	Baguley Sanatorium...	...	9	6	...	3
	Total .....	23	233	206	33	17
ALL DISEASES.....		449	2,3 2	2,215	189	347

PATIENTS SENT TO MONSALL OR CLAYTON, FROM DISTRICTS OUTSIDE THE CITY, DURING THE YEAR 1905.

DISEASE	Hardman Street Dispensary	Maturity Hospital	Northern Hospital	Swinton Schools	Royal Infirmary	Pendlebury Hospital	Stretford	Barnes' Convales. Hospital			
Smallpox .....	...	...	...	...	...	...	...	...	...	...	...
Scarlatina .....	...	...	3	17	2	15	1	1	...	...	...
Diphtheria ..	...	...	...	1	...	1	...	...	...	...	...
Enteric Fever .....	...	...	...	...	2	...	...	1	...	...	...
Other Diseases.....	...	1	2	...	3	1	...	...	...	...	...

Total, 51.

TABLE P, 1905.—WORK OF SANITARY DEPARTMENT FOR THE YEAR.

TOWNSHIPS																					TOTALS
Ancoats	Central	St. George's	Cheetham	Crumpsall	Blackley	Harpurhey	Moston	Newton	Bradford	Beswick	Clayton	Ardwick	Openshaw	Gorton (West)	Rusholme and Kirkmanshulme	Chorlton-upon-Medlock	Hulme	Moss Side (Incorporated Nov. 1904)	Withington		
Complaints to Sanitary Superintendent ...	318	428	244	230	14	6	21	16	126	65	25	6	182	55	51	149	316	194	160	...	
Dwelling-houses .....	5,604	4,251	5,650	4,246	405	558	978	1,239	3,140	1,641	1,365	1,678	2,188	2,288	2,200	1,479	3,545	7,596	1,272	...	
Newly-infected Dwelling-houses .....	296	129	232	249	39	40	81	62	210	126	111	62	218	147	151	154	234	303	113	...	
Cellars.....	5	...	5	252	...	...	...	...	...	3	...	...	7	1	...	25	...	2	2	...	
Schools .....	5	...	11	3	...	2	3	...	9	7	1	...	3	6	1	13	2	1	...	...	
Factories and Workshops .....	61	...	79	76	6	1	1	...	3	...	10	4	2	...	1	...	10	...	17	...	
Lodging-houses .....	414	1,286	1,084	976	...	...	...	...	1	15	15	...	15	12	2	1	286	604	...	...	
Offensive Trades .....	31	24	86	...	1	1	...	...	14	13	16	6	1	1	4	11	6	1	28	...	
Dairies and Milkshops.....	91	271	86	387	67	111	148	180	339	62	32	36	296	382	330	228	528	385	208	...	
Bakehouses .....	266	262	212	432	26	34	124	42	101	39	2	26	116	47	69	88	428	319	144	...	
Canal Boats .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Slaughter-houses .....	...	24	...	1	...	...	...	...	...	1	...	...	...	...	...	20	...	...	...	...	
Tips for Refuse.....	..	...	4	1	...	...	...	149	7	...	...	...	1	17	...	4	...	...	...	...	
Miscellaneous Inspections .....	711	1,782	744	293	65	18	16	256	137	165	251	435	687	273	95	272	750	2,080	731	...	
Factories and Workshops by Shop Hours, &c., Inspectors.....	1,148	4,921	1,138	2,666	35	25	113	31	141	74	3	46	320	117	184	221	1,281	819	319	...	
Shops by Shop Hours, &c., Inspectors	766	1,599	699	1,150	65	90	314	126	234	344	...	107	370	446	268	534	732	984	537	...	
Infected Rooms Disinfected .....	1,009	490	486	483	42	82	147	174	671	74	305	...	963	550	779	295	549	1,417	7	...	
Infected Dwellings Re-inspected .....	690	199	594	496	82	122	269	162	360	278	459	379	290	362	216	325	511	707	228	...	
Drains Tested by Water .....	394	319	545	353	145	104	183	36	425	323	261	8	309	300	613	250	638	767	214	...	
Smoke { Observations made .....	32	375	21	17	23	13	3	8	61	47	1	26	22	32	23	19	21	39	15	6	
Abatement { Proceedings before Magistrates	6	13	4	4	6	3	1	5	18	12	...	8	9	5	7	...	4	8	3	...	
FoodAdul- { Samples Collected for Analysis	174	209	174	68	12	16	43	21	90	68	...	21	103	126	99	58	300	444	317	266	
teration { Proceedings before Magistrates	3	38	16	2	...	...	1	...	2	3	...	1	1	2	7	2	9	23	17	19	
Asphits reported to Cleansing Department for emptying .....	19	4	4	7	122	60	113	64	38	22	21	184	8	21	55	50	10	4	18	...	
Receptacles reported to Cleansing Department for emptying.....	108	35	92	249	1	1	...	...	6	2	58	...	32	1	5	2	74	78	1	...	
Notices issued for Abatement of Nuisances.	976	868	1,423	1,047	70	139	244	134	488	316	184	104	664	193	431	358	756	1,791	271	...	
Letters written for Abatement of Nuisances	70	59	102	125	8	8	11	5	32	19	...	6	21	7	24	15	53	131	6	...	
Reports made to Medical Officer of Health	63	7	39	21	...	...	...	6	7	1	10	...	1	...	1	43	5	17	21	...	
Legal proceedings taken .....	21	25	44	26	1	1	...	...	1	3	1	1	2	4	9	3	18	74	...	...	
Total Nuisances abated .....	710	753	1,159	881	66	136	232	143	466	222	292	124	652	187	240	410	707	1,406	193	...	
† Number of Cottages under Five Rooms....	7435	4964	9037	729	522	923	688	367	4409	2621	1285	402	4552	3510	3221	826	3805	8157	268	909	

\* 18 Samples procured from Outside the City.

† 7 cases Infringement of Canal Boats Acts.

‡ Census 1901.



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